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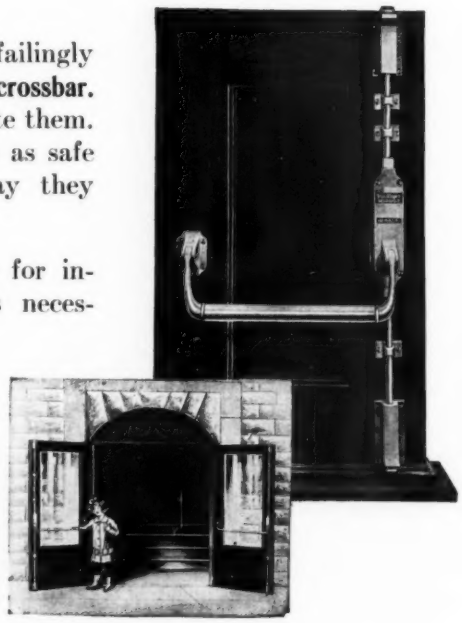

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THE LINCOLN MONUMENT AT WASHINGTON. VERY MUCH AS IT WILL APPEAR WHEN FINALLY COMPLETED

"As I would not be a slave, so would I not be a master. This expresses my idea of democracy. Whatever differs from this, to the extent of the difference, is no democracy."—ABRAHAM LINCOLN

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Shadows and Straws

THE PUBLIC BUILDING SITUATION at Washington has developed to a considerable degree during the last month. The Treasury Annex Building, authorized by the Senate, and the discussion of which by that body was published as a Supplement to the August Journal, has been passed by the House. That body, however, struck from the Senate bill the clause requiring the approval of the plans by the Commission of Fine Arts. This sent the bill into conference, from which it emerged in the form adopted by the House, the Senate conferees receding from the position taken by that body.

Mr. Cooper, of Wisconsin, defended the valuable work of the Commission, as did Mr. Campbell, of Kansas, and Mr. Green, of Iowa, but the resentment of Mr. Burnett, of Alabama, and of Mr. Cannon, of Illinois, although expressed in terms which clouded the issue by a recital of offenses not at all chargeable to the Commission, prevailed upon the small number of members present, and the Senate amendment was lost by a vote of 162 to 86.

It must be remembered in considering this question that the action of the Senate gave a mandatory power to the Commission of Fine Arts. Under the Executive Order from which it now derives its powers, the plans will still be submitted to it for criticism, but it will have no power to insist upon any changes. As we have before stated, it is understood, we believe, that the design of the building will be such as to make the Lafayette Place façade adaptable to a continuance of the design when future buildings are erected on the site now occupied by the Belasco Theater, the old Cameron House and the Cosmos Club. The building, in all probability, will be begun without delay. It is to cost $1,250,000, and to be finished in about a year's time.

THE JOURNAL ANNOUNCES the departure for England of Mr. Frederick L. Ackerman, of the firm of Trowbridge and Ackerman, of New York City. Mr. Ackerman has served with great ability on the Institute Committee on Public Information and the Committee on Town Planning. He goes to Europe as the special correspondent of the Journal, and particularly for making a study of the vast housing undertakings which have already been carried through by the British Government, as well as those on an even larger scale which are now projected for the re-housing of her working classes after the war.

Mr. Ackerman's investigations will be narrated in the Journal as fast as they are received from him, and will form, perhaps, the most important contribution to the literature of housing which has yet appeared, since it will be based upon the larger governmental interest which the war has forced in this subject. That the policy of Great Britain will be reflected in the reconstruction of France and Belgium may not be doubted, but of even greater moment is the certainty that the United States will also react in like manner. The coöperative idea which is now leading to the rapid formation of National Farm Loan Associations, under the supervision of the Farm Loan Board, has given a great impulse to the possible application of similar principles, with governmental aid, in home building.

The more important countries of the world

have long accepted this idea as a legitimate and necessary governmental function, and Mr. Ackerman will make important contributions to the existing knowledge of their workings and their further extension as a result of the war. These articles will appear in many issues of the Journal and will be supplemented by others from the pens of the foremost authorities on the subject of housing, both in the United States and abroad.

IN RESPONSE TO THE SUGGESTION for another architectural society to engage in stimulating the perceptions of governmental authorities and legislators in their outlook upon questions of art, there have appeared in the Bulletin of the Illinois Society of Architects some excellent letters, all of which point out the desirability of more devotion to the Institute rather than a division of that which now exists. The letter of Mr. Hubert E. Hewitt, of Peoria, Ill., deserves a wide reading, however, for it is so fine a summing up of all the factors, some of which escape attention in a too general consideration of the problems involved. Mr. Hewitt's letter is as follows:

I have read and I heartily approve of President Malcomson's suggestions to stimulate the Government's appreciation of Architecture, but it seems to me that the real cause of the trouble lies so deep that his suggestions might be supplemented by a remedy more fundamental and more far-reaching than that which he proposes.

The average Congressman is the average man-of-affairs. The average man-of-affairs who has reached middle age or beyond without acquiring that degree of culture which enables him to appreciate Art and the value of Art to life, is not likely to be stimulated to such an appreciation after that time. An appeal to him for better Architecture or better Art of any kind is likely to be in vain. It is sad, but true, that the average man has an appreciation of Art comparable, perhaps, to a cow's appreciation of an automobile. The cow's choice would be one made of clover and grains, with salt trimmings. She "knows what she likes."

May it not be true that the real remedy consists in the cultural education of the people that the Congressman represents? And that means, first of all, the instilling into the child throughout its schooling from kindergarten to university the great fact (which some men realize too late and some never realize at all) that the quickening and development of the soul is of equal, if not greater, importance than the development of our material selves.

The "man in the street" still associates Art, of all kinds, with long hair and "temperament." It is something for the rich and the idle to play with and the "odd genius" to produce. Art in this country at the present time is distinctly not "of the people" and it is difficult to persuade them that it is "for the people." I speak of Art instead of Architecture for the sake of generalization. The Arts go hand in hand.

It is trite to say that the lack of public interest in all branches of Art is due to the essentially materialistic time in which we live. We all know that. But, after the war—will there be an opportunity? I think there will. We shall be sobered, unified, perhaps chastened. Men's minds will turn from material things and the starved souls of men will cry out for food. Is it too much to hope that, if we take advantage of the opportunity, we may have a great Art revival when the war is over?

In an incredibly short time, we have become the greatest nation, materially, in the world. May we not become, with comparable swiftness, the greatest nation in a finer sense? HUBERT E. HEWITT, *Peoria, Ill.*

IN CONNECTION WITH the British Government's study of the technical questions in bearing upon the building of the large number of houses for industrial workers after the war, the President of the Royal Institute of British Architects has, upon request from the authorities, nominated Sir Aston Webb to serve on behalf of the R. I. B. A. on the committee which has been set up by the Local Government Board. A committee of the R. I. B. A. has been constituted by the Council and is now considering the question from the architect's point of view. The committee consists of the President, the Honorary Secretary, Sir Aston Webb, Professor Abercrombie, Professor Adshead, W. R. Davidge, W. A. Harvey, Arthur Keen, H. V. Lanchester, D. B. Niven, G. Gilbert Scott, J. W. Simpson, H. D. Searles Wood, George Hubbard, and Percy B. Tubbs. The allied architectural societies have been asked to nominate representatives to serve on the committee, while the principle of local committees to deal with local problems and keep in touch with the central committee has been recommended for adoption. These activities indicate that the question of living conditions has attained an economic importance which will surely lead to better things in England. We must follow, and the part played by architects, both here and there, in bringing about those betterments which are long overdue, will go far toward determining the position of the profession in a future to which we look forward with such eager hope. Surely human values will be lifted far higher in the new scale; we cannot believe otherwise.

What Is a House?

By CHARLES HARRIS WHITAKER

I

SINCE the war began, the British Government, under such financial and industrial pressure as never before befell a nation, has spent millions upon millions in building houses of all kinds for its workers. It is one of the most remarkable and deeply significant transformations wrought by War. While her vast industrial expansion and its accompanying congestion of workers are the undoubted causes of England's huge expenditure for better homes, the deeper significance may be found in her plans for carrying on this program as a measure of post-war prudence. War has raised the standard of the house in England for all time. It has given a new meaning to the word.

Great was the pressure under which England labored and pressing was the emergency with which she had to cope. The life of her armies, upon which her own life hung in the balance, was in the keeping of her factories and workshops. Yet as the old ones doubled, trebled, quadrupled their size over night, as new ones larger than any the world had ever seen sprang up like magic, there also grew the parallel need for more houses in which the workers could live. And there also grew the perception that if the workers were to give their utmost in skill and energy they must be given the utmost in home life. The renewal and constant maintenance of vitality meant more ships, more guns, more ammunition. And then came the miracle!

With sound economic foresight, England determined to build permanent houses, except in cases where the emergency was so dire as to compel temporary expedients. She found that taking into account the expense of applying the utilities (streets, water, gas, sewage), the difference in cost between temporary and permanent houses was so little as to be negligible in her calculations. Rather than accept a questionable post-war salvage from temporary structures, with the inevitable temptation to continue their use as slums, she resolved to create a permanent national asset. Thus there have grown up in an incredibly short time whole new towns and villages which will not only remain after the war but which will compel a generally higher standard for workmen's homes, —for permanency is only a part of the miracle.

Having come to this decision, it became necessary to ask what kind of houses to build, in other words, "What is a house?" During the last hundred years of industrial expansion the definition of a house has been sinking slowly to a level where it included almost everything which could claim walls and a roof. The percentage of unsanitary, disease-breeding structures inhabited by men, women, and children in all the so-called civilized countries of the world has been a sad blot on their escutcheon. Without exception, all the great nations except the United States—even the newer lands of Australia and New Zealand are ahead of us—have recognized this condition and accepted the duty of attempting its amelioration by financial aid of different kinds, as a legitimate and just governmental function. It may be said without hesitation that the application of science and governmental aid to home-building for workmen in Germany was one of her vital steps in the great scheme of war preparedness. Her model villages have been cited the world over, while her coöperative home-building and land-owning associations, fostered by the government, have been studied with profit in all other countries. England had begun to deal with this question, of late years, so that when she was compelled to undertake an immediate industrial expansion which should outweigh and outshoot Germany's highly organized machine, the accompanying problem of house-building was not an entire novelty. She had dealt with it before. Her garden cities were among the pioneering movements of modern housing reform. All her communities have large powers in dealing with the question, and the model tenements of London, Liverpool, Glasgow, and other cities, though far from solving the question of "What is a house?" were long steps forward. Of profound significance is the fact that since war began, London has demolished

acres of slums and erected model tenements thereon. In order to bring the rentals of these within reach of workmen, she has charged off the entire cost of the land against her more prosperous areas!

But in the middle of war, with the determination made to spend millions in new houses, England asked herself fairly and squarely, "What is a house?" Perhaps her answer will do more than anything else toward solving the social, economic, and political problems which the end of the war will lay before every nation with a new and sterner emphasis than ever before. The houses she has built would not do for the United States. They are built in full recognition of certain long-established traditions and modes of life. They have no central heat, for example, but are generally heated with fireplaces, while their interior planning is not after our methods. They range in size from two to five rooms, with bath, with rentals varying from $1.80 to $3.60 a week. For such sums it probably is impossible to rent their equivalent elsewhere in the world, although it is no doubt true that these low rentals are only made possible by governmental willingness to accept a rate of return on the investment such as would not satisfy private capital. It is also possible that England may have to write off, as a war expense, the difference in cost of these houses, at war-time prices and those normally obtaining. Curiously enough, many people exclaim at the idea of such a possible waste, forgetting that war is nothing but a process of throwing away money, and that it does not matter whether it goes into ships, guns, aëroplanes, or houses, so long as the end is attained. But England finds a return on her investment in houses which cannot be measured in money, and it is highly probable that of all her vast expenditures the houses she has built for her workers will remain as one of the very few revenue-producing factors after it is all over.

Private capital failed to provide England with the houses she needed in order to wage a successful war. Building costs were higher than normal, and private capital feared that if it built in war time, it might be left with houses on its hands which could afterward be duplicated for much less money. It also shared in the general uncertainty as to how reconstruction might affect industries expanded under war pressure. The war might leave these, temporarily, without usefulness and the houses in such a locality tenantless. But the Government could not allow any such doubts to jeopardize its success in war. At no matter what cost—or what loss—it had to have houses. In this recognition lies the kernel of a hope that the definition of a house is to be permanently revised.

War has shown the full meaning of the house as a factor in national preservation, for war brings nations face to face with national death, and it is then that nations see themselves. Can it be doubted that Peace will ever again allow the house to sink to the low level of the last hundred years? Can it be possible that the plain business value which has been found to lie in the good house will be ignored by Peace? The measure of a nation's prosperity and strength is shown to lie, not in the size of its factories, the elegance of its public buildings, the luxury of its hotels, but in the small thing known as a house. Germany learned this before the war and applied her knowledge on a vast scale, dastardly as was the end she pursued. Other nations have learned through the need of defeating that end, and will not forget. But woe to the nation which forgets to learn!

In the United States today our industrial war-time expansion, upon which so much depends, is hampered and impeded by the lack of houses. It is further restricted by congestion in the hideous structures which pass under that name. Our expansion has been so rapid that this condition grew up almost unnoticed. Under the pretense of shortage of workers, there come increasing requests for permission to work men, women, and children longer hours than the law permits. The answer, in almost every case, lies in the fact that the real shortage is in houses and rooms. In such cases, increased production is possible only by overworking those who can house themselves, and the end of that would be deplorable. Many factories making war necessaries are not running full because they cannot house the workers. Wherever men and women are working in these centers, their vitality frequently is impaired by the conditions under which they live.

Private capital is failing here as it failed in England, and for the same reasons. The situation has assumed alarming proportions,

and the approach of winter will render intolerable many of the present makeshifts used for houses all over the country. The conditions in Cleveland, Akron, Bayonne, Bridgeport, Norfolk, Newport News, in fact wherever one turns, are fraught with elements of unrest and discontent which are finding frequent expression. As a consequence there is delay in that industrial production which is so vital—a delay which costs so huge a sum. For every day the end of the war is put off, we may charge ourselves with something like $50,000,000! In the presence of this fact, how shall we answer the question "What is a house?"

The administration at Washington is fully alive to the importance of these conditions and is preparing to cope with them. If it answers the question wisely and with foresight, the United States will learn a great and valuable lesson, for we shall learn that if a decent house is essential to war, it will be equally essential to our economic life after the war. Upon no vital question affecting human welfare and human progress toward that larger democracy for which we are giving our blood and our treasure will the light of war beat with a more enduring flame than upon the one, "What is a house?"

II

In building her new towns and villages, England did not treat the house as an isolated factor. In the first place, she embodied in its design the traditions of that rural domestic architecture which has so much delighted the thousands of Americans who have roamed the English countryside. She arranged them, whether singly or in groups, to form a harmonious whole and to avoid the deadly monotony of straight streets lined with houses of one pattern, no one differing from any other and known only by a number, each possessing as much outward atmosphere of inviting appearance as a row of freight cars. Nothing has contributed more to the slowness with which we respond to questions of civic import than this deadly monotony. The man of means builds a home in which he may give expression to his tastes and inclinations. Slowly, but surely, this kind of domestic architecture has lifted itself out of the slough of the Victorian era and the slavish copying by architects too lazy or too ignorant to study their problems, and begun to claim a place as a distinctly national development of value. But this applies only to an infinitesimally small proportion of our house-building operations. In the main, our towns and cities, and even our rural districts, are made hideous by the multitude of tawdry houses and the ugliness of surroundings which that tawdriness inevitably breeds—bill-boards, dumps, shanties, with waste paper and refuse scattered in indiscriminate profusion. Slowly, but surely, we become accustomed to it; we tolerate it; we ignore it. But all unconsciously we never forget it, for we flee it as a plague. We flee it for the country when we can. We flee it for anything which offers a distraction. And when men, women, and children unconsciously begin to flee the neighborhood of their home, what chance has the community to develop civic, social, or even economic progress? Such flight is the unconscious surrender of a political ideal, the precursor of revolutions.

Yet against the ugliness of our miles and miles of desolate, monotonous streets, we can only point to the one-time picturesque quality of thousands of European communities by reminding ourselves that we have made progress in several important directions.

But why were we willing to accept advances in sanitation, comfort, convenience, with so little thought of the preservation of those other qualities of charm and picturesque attractiveness which we so much admire when we visit Europe, or still find untouched here and there in our own country? The answer involves a long study of our industrial and social transformations, wherein ruthless competition, unchecked by any community foresight, has raised land values unequally, destroyed them by the same ruthless method, and made highly speculative that which should of all things be permanent —realty values.

The full answer, taking cognizance of these things yet denying them their right to lower the standards of a nation by steadily reducing, first, the size of the lot, then the size of the house, then the size of the room, enunciates the warning that this ever more and more relentless compression also squeezes out the moral and physical values which are the only source of national progress.

In her wartime house-building, England has recognized this as a fundamental principle.

Her houses have ample lot-room and a maximum of light and air. Instead of being monotonous they are as varied in their picturesque character as any of the ancient towns of England. These new villages are striking examples of what may be done when the size of lot and house and room —and their design and arrangement—are not arbitrarily and ruthlessly sacrificed to the financial limitations of private capital. And this is no indictment of the little-understood thing we call capital. It is an indictment of the community and of the nation which is so short-sighted as first to permit and then to compel, as a measure of business salvation to the owner, the erection of structures, houses, tenements, that quickly decline in value through deterioration, ultimately diminish the taxable value of the neighborhood in which they stand, and always lower the standards, moral and physical, of those who inhabit them.

This is the civic crime of the ages—the acceptance by the community of a business principle which every good business man would reject in his own business without the slightest hesitation. Against this condition, of what value are architects and building codes? Their efforts must be directed to cheapening the cost of construction, both by reduction in space area per family and by the use of the least expensive materials and methods of construction which will pass the code, either honestly or by connivance. Today we are in the grip of this inexorable condition; tomorrow, how long deferred we know not, we shall begin to emerge from it, or else one lesson of the war will be lost.

The building of houses is today a speculation. Whether a man builds with the hope of a profit through sale, or rise in value, or with the hope that he will not sustain a loss, does not matter. The speculative idea is there; it cannot be escaped. Worse than this, one man bent upon a speculation which promises large profits to him by taking advantage of the helpless community can erect a type of structure which will so damage a neighborhood as to force others to put their property to the same use. This is only a temporary expedient. In the end the community loses. It suffers the loss in taxable values which is the anxious consideration of the financial authorities of all our cities, and it suffers the moral loss of a descending rather than an ascending scale of life. It is idle to condemn speculative builders and so-called private capital for these practices. The fundamental fault, which must and will be corrected, is the neglect of the community to see that the longer it gives *carte blanche* to the individual to convert land values to his private gain by no matter what means, the larger will be the bill which the community will have to pay in undoing his misdeeds. This is becoming so increasingly evident that the zoning or districting law, which governs the character and occupancy of new structures in a city, is being applied in several of our American cities. New York City welcomed it with open arms, as the only measure of conserving the city's taxable values and of giving any permanency to realty. It undoubtedly offers a large avenue of relief. European countries have applied it successfully, and while it may have a tendency temporarily to diminish the volume of building, in the end it encourages the erection of good buildings as a permanent rather than a speculative investment.

"What is a house?" It is the prime element of national growth. It is the soil whence springs that eagerness in the heart of every man for a home of his own. It is, after all, the physical attribute of life upon the possession or retention of which most of our energy is directed. Because of these things, it is the backbone of the nation. By the quality of its appearance, its convenience, its durability, one may infallibly determine the real degree of a nation's prosperity and civilization.

"What is a house?" It is not a solitary entity by any means. Let us not forget that. Just houses, no matter how well they answer our question, would not suffice. With houses go other things—good streets, for example (although our blind adherence to the old street idea wastes acres of land and involves costs of upkeep which are rapidly challenging attention), gas, water, light, fire protection (which ought to be needed less and less, rather than more and more), garbage removal—all of these things are indispensable in any modern community. But, in addition to these purely physical attributes, there must be provided opportunities for social recreation, for play, for the influences of the school, the drama, music, the dance, the arts in general. That is why England, in building thousands of homes for her workers (as Germany did before her), has

had the foresight to build, wherever the existing community was incapable of meeting the need, schools, churches, halls, recreation grounds, laundries, and even public kitchens. There are large open areas for the children—and for grown-ups, too.

"Socialism," says somebody. "Fad," says another. "Paternalism," cries a third. But, mark this well, the least important thing about it is the name by which it is called. Those who live principally for the pleasure of hugging words to their bosom long after all spark of life has left the letters which they spell glibly over and over, may continue the pursuit of this childish pastime. Men who have sense enough to recognize human forces and currents—who know that the world is moved by these and that progress comes through them and not by the names they are called—such men will understand that England is putting her house in order by putting the houses of her people in order. In other words, she is getting ready to pay her debts by organizing her commerce and industry on new lines, far in advance of anything else (as Germany did before her). She is preparing for her reëntrance into world markets on a larger scale than before, for it is from those markets that all the nations must collect the money for paying their interest charges and debts. Such an economic measure will be precedent to the payment of national debts by all nations, ourselves included. And in the working out of that program, the house, as a giver of rest and contentment, source of satisfaction, emblem of true community growth, and forerunner of sound community values, will play a part which England seems to understand, at last.

Shall we learn?

(To be continued)

Gothic Art, the War and After

By A. KINGSLEY PORTER

THE cathedral of Reims is in ruins. We all know it. We have grown accustomed—almost callous—to the fact. The cathedral of Reims, unequaled for its façade and for its wealth of sculpture, is destroyed. We shall nevermore study the wonderful glass of the clearstory, with its blazing scarlets and reds, the warmest, the most pulsating, the most daring glasswork in all France. The grave saints that lined the portals with faces so full of dignity and Christian fortitude are broken into bits. Even the wonderful angel of never-to-be-forgotten gentleness, so solicitous, so tender, was not spared. What two fires and the wars of six hundred years had left uninjured our age has annihilated. German cannonading was able to destroy a monument the equal of which fifteen centuries of boasted German culture have been unable to produce.

Nor has the destruction been limited to the cathedral of Reims. The region through which the German armies have swept, leveling all to the ground before them, was the classic region, the Tuscany, the Attica of France.

Gothic art, the most perfect of all expressions of beauty, reached its complete culmination only in a small district. It was in the Ile-de-France, and especially in the region to the east of Paris, that it was born and that it attained its flower. It was copied from one end of Europe to the other, but in its pure essence, at its absolute best, it is to be found only here. Complete knowledge is yet lacking, but it is certain that in addition to the cathedral of Reims, the cathedral of Soissons, with its fairy-like south transept, its noble nave; St.-Remi; presumably Morienval, the Rucellai Madonna of Gothic architecture, over which generations of archeologists have broken their lances; countless other abbeys and parishes lie in more or less complete ruin. Since the barbarian invasions art has suffered no such loss. It is the study of these early buildings that has opened our eyes to the true character and true beauty of medieval work. Each of the country churches of the Soissonnais was a masterpiece of art in its way, each unrivaled, each with its own individual character.

It may be that in the centuries to come the other wrongs of this war will be forgotten. We no longer ask whether the Huns did or did not have a justifiable pretext for overrunning Italy. Today we care very little whether Alaric took

or did not take Rome, or how long he held it. We have forgotten about the sufferings of the vanquished, the wrongs of the women, the death agony of individuals and peoples. We hardly know even the name of the barbarians who overran Greece. Their conquests, their gains and losses, are recorded only in the obscure pages of dusty histories. What we are acutely conscious of is the fact that Greek art was in great part destroyed, that not a single Greek painting has come down to us, that the works of Menander and Sappho are lost, that the Greek temples are in ruins, that masterpieces of Greek sculpture ended in the lime-kiln. And so it shall be with this war. Other things, however atrocious, time, which heals almost everything, may cure. But the wanton destruction of Gothic art must always remain to the end of time an act which the civilized world can never forgive, a wrong which the Germans have committed not only against France, but against all humanity, against themselves. For centuries still to come the German children must learn that their forefathers, in wantonness and cold blood, destroyed the most beautiful of arts, and they must realize that their own lives have by this act been deprived of a source of happiness which they might otherwise enjoy. The barbarians who sacked Rome might plead one excuse—they knew not what they did. They had no conception of art nor of its value. The Germans can plead no such excuse. The Germans knew what they did. They knew the value of what they destroyed.

When the war ends, the question must inevitably arise, What is to be done with the partially ruined monuments left by the Germans? There is grave reason to fear that the mistake of a century ago may be repeated. French Gothic architecture, it will be remembered, suffered terrible damage in the Revolution, but worse than this were the ill-advised restorations which followed. The question of restoration is an exceedingly delicate one. It is the friends, and the very sincere friends of the monuments, who promote it, frequently at great sacrifices. Their zeal and good intentions are undoubted. It therefore seems ungrateful to point to them as dangers. Since, however, an agitation is already being started to restore the ruined Gothic monuments, it is very necessary to come to a realization of what may only too probably result from misguided enthusiasm.

Gothic monuments are valuable from two distinct points of view. In the first place, they are historical documents, giving us information about past ages, the philosophy, the building methods, the character of the Middle Ages. This may be called their archeological value. Even more important is their purely artistic value, the joy they are capable of communicating as a thing of beauty. Both these values are liable to, nay almost certain of, destruction by restoration.

From the point of view of the archeologist, a restoration puts in his hand a falsified document. It is impossible to be certain of what is old, what is restored upon reliable authority, and what is merely conjecture liable to be entirely misleading. The very fact that restorations are generally cleverly done makes it impossible to disentangle the old from the new. Only one who has worked for years upon medieval monuments can realize the extent of the mischief wrought by modern renovations. Paradoxical as the statement may seem, the better these restorations are, the more deplorable is the archeological result.

A few instances of the way in which the modern restorer has led astray the learned may give some idea of this evil. In the ninth decade of the nineteenth century the church of S. Vincenzo in Prato at Milan was restored. It was rescued from almost certain destruction in being used as a chemical factory, and reopened to the Christian cult. At that time it was believed that arched corbel-tables were characteristic of all Lombard monuments, and the cornice of the façade was rebuilt with arched corbel-tables. As a matter of fact, this motive was not used in Lombardy until the eleventh century, while S. Vincenzo dates from the ninth century. It was forgotten that the corbel-tables had been added by restorers, and archeologists concluded that those of S. Vincenzo were of the ninth century. The entire history of Lombard architecture was consequently confused. Because of the corbel-tables of S. Vincenzo a whole group of monuments of later date was ascribed to the Carlovingian epoch.

Nothing would be easier than to multiply similar instances. The statues of the S. Zeno pontile at Verona are modern, added in the nineteenth century restoration, yet they have been discussed as ancient by every critic of

Italian medieval sculpture, and whole theories of attribution have been based upon them. The best and most conscientious archeologists have been frequently deceived by restorations. Cattaneo published a modern capital of S. Vincenzo as an example of the Lombard style of the ninth century. Professor Moore was deceived by the modern statues of the façade of Paris. An archeologist of the present day, when he studies a medieval monument, is obliged to spend weeks in tracing the changes wrought in the nineteenth century. Only so can he be certain what is genuine and what is restoration. And in many monuments, even of the greatest importance, it is already impossible to prove what is new and what is old. Such buildings are without archeological value, although they may be nine-tenths genuine. It is impossible to be certain that the particular point in question may not be included in the one-tenth conjecture.

The usual plea for restoration is founded upon the esthetic appeal of a work of art. It is generally felt that the total effect is marred by damaged portions and that the building can be better enjoyed if these are put in harmony with the rest so as not to distract the attention. Yet in point of fact I think even the most tactful modern restoration is quite so pernicious from an artistic as from an archeological point of view. Modern workmen cannot reproduce nor copy Gothic work. The hardness of modern machine-made methods completely ruins that verve and feeling which is the soul of medieval art. Here, again, the restoration is so much the more mischievous that it is not easy to disentangle the new portions from the ancient. Better, a thousand times, a ruin than a restored building. The ruin may have a certain picturesqueness of its own; at any rate it tells no lies. What is there is genuine, is medieval. The eye that is practised may imagine missing portions, reconstructing mentally the building as it was. In the restored building, however, the original beauty is hopelessly and forever lost. Not even the most experienced eye can reconstitute the edifice as it was, strip it of the modern metallic hardness, reinvest it with its ancient poetry. It can not be emphasized too solemnly that restoration of medieval work is destruction of medieval art.

It would be as vain to attempt to restore the ruined Gothic churches as to repaint the lost pictures of Apelles. A Shelley, it is true, might give us, not a lost tragedy of Æschylus (that would, indeed, be impossible), but another poem conceivably as beautiful; but there are no Shelleys among modern architects. The touch of the modern on medieval monuments is a profanation and a destruction. During the last half century the medieval monuments of all Europe have been gradually, little by little, replaced by modern copies under the name of restoration. The inferiority of the copies is so great that I have often felt that it would be better to tear a building down absolutely than to make an unbeautiful misleading copy for the misinformation of posterity. No one—least of all an art critic—suggested, when the Mona Lisa was stolen from the Louvre, that the loss could be made good by having a copy painted and replaced in the frame. Yet how much more nearly would a copy of the Mona Lisa approach the value of the original than a copy of the cathedral of Reims could approach the building which has been destroyed!

We must realize frankly, therefore, that the destroyed churches of France are in danger of a fate even worse than that which has already befallen them. Ill-advised enthusiasm among people whose perceptions are not specially trained, is very liable to result in crowding the competent authority—which is the official *Commission des Monuments Historiques*—into sanctioning or even promoting the restoration of these buildings.

Gothic churches cannot and must not be restored. What is done cannot be undone. The losses caused by the Revolution, in ignorance, were great. Of an important part of the heritage which earlier centuries had already in ignorance depleted, the Germans have in knowledge deprived all humanity. Let us not make the matter worse and still further reduce the patrimony by restoration. Works of restoration should be undertaken only when necessary to prevent further disintegration. Let the destroyed monuments of France stand as ruins, but noble, poetic, beautiful ruins, not machine-made, modern churches. Let them stand a sempiternal reproach and source of shame to the Germans; but let it never be said that their friends destroyed what their enemies had spared.

Outline of a Tentative Program for Dealing with the Housing Shortage in War Industries*

Preliminary Statement

The essential facts leading to the presentation of this program are the knowledge of the house shortage and congestion which impair our industrial production and which will surely lead to labor unrest and a consequent further impairment, and a study of the methods by which England has coped with a similar condition.

In any consideration of solutions, the question of post-war salvage should not be allowed to enter into the decision of how best to deal with any problem. No loss sustained in building operations can possibly be challenged in the face of the cost of delay involved in a scheme of expenditure so colossal as this war makes necessary, quite aside from the plain duty of conserving the utmost in human life.

A. Legislation Required.

1. The Government shall have power to take land for housing purposes throughout the duration of the war.

[NOTE.—Under the "Defense of the Realm" Act, England has this power under the following provisions:

"to take possession of any land and to construct military works, including roads, whereon, and to remove any trees, hedges, and fences therefrom; to take possession of any buildings or other property, including work for the supply of gas, electricity or water, or of any sources of water supply; . . . to cause any buildings or structures to be destroyed, or any property to be moved from one place to another or to be destroyed; . . . to do any other act involving interference with private rights or property which is necessary for the purpose aforesaid." Nov. 28, 1914.

"If, after the competent naval or military authority has issued a notice that he has taken or intends to take possesion of any movable property in pursuance of this regulation, any person having control of any such property sells, removes, or secretes it without the consent of the competent naval or military authority he shall be guilty of an offense against these regulations." May 10, 1916.]

2. An appropriation of $100,000,000, of which $200,000 is set aside for administrative purposes, for erecting or aiding in the erection of houses for workers engaged in making war necessaries.

[NOTE.—This sum is based on a rough calculation of housing the equivalent of 40,000 families, at a cost of $2,500 per family unit.]

B. Contingent Legislation, submitted as bearing on the whole problem.

1. The right to take over any unoccupied property for housing use.

[NOTE.—Under the "Defense of the Realm" Act, England has this power in the following clause:

"It shall be lawful for the Admiralty or Army Council or the Ministry of Munitions to take possession of any unoccupied premises for the purpose of housing workmen engaged in the production, storage or transport of war material."]

2. The right to prevent the raising of rentals.

[NOTE.—This has been one of the most powerful factors in stabilizing labor conditions in England, and has been in effect since early in the war.]

3. The right to fix prices for canteens or boarding houses.

[NOTE.—England has lately enacted legislation known as the "Billeting Act," which makes it appear that this regulation was found necessary, but the act has not been in force long enough for its value to be determined.]

C. Methods of Administering Funds.

[NOTE.—The pressing emergency requires the discard of all plans based on the coöperative idea, as unequal to any quick action. There are three plans under which the problem may be solved expeditiously.]

1. Making funds available to those manufacturers who are making war materials and who can quickly conduct a housing undertaking of the kind necessary to meet their needs.

[NOTE.—Whether all or part of the money is advanced by the Government, arrangements may be made for the sale of the Government's interest at the close of the war, upon a basis of residual value to be established. In England, advances have been made to manufacturers for housing purposes, but in each case the terms have been arranged according to the circumstances. In all cases, the manufacturer assumes the whole risk.

This plan has the merit of expedition, wherever it can be worked. It has the great demerit of involving house rental with labor problems and is probably the cause of the failure of so many industrial housing operations. As a principle in housing it is generally deprecated by students of the question.]

2. Making funds available to stock companies generally known as housing associations, either by advancing all or part of the money required, with provision for sale by the Government of its interest, after the war, at a residual value to be determined.

This plan has also the merit of expedition, and could no doubt be used quickly enough in certain places. It avoids any relation with the manufacturer, insures a probably good administration, and would undoubtedly work out a high post-war value.

3. Having the Government buy land and build houses.

This method was adopted by the British Government and applied on a colossal scale as indispensable to war production. It should be applied in this country with the utmost celerity as a means of stabilizing labor, relieving congestion, increasing vitality, and augmenting the industrial production which is so vital.

D. Types of Houses Required.

1. Single-family dwellings, whether built in units, of one, two, three, or four.

2. Houses adapted to the taking of boarders by a family or keeper.

[NOTE.—These are far preferable to the hostels built by the British Government, and designed to serve as dormitories. Inability to fix hours or prescribe the character of the occupancy soon developed great objection to their use, and many of those built are today only partially occupied, even in the face of serious congestion in the locality.]

3. Multi-family houses of the urban tenement type.

These offer quick and cheap solutions, wherever possible. They permit centralization of heating, lighting, laundries, etc., and will, in urban centers, house a family cheaper than by single houses or groups of two, three, or four family types.

4. Temporary structures.

These should be built only where the emergency compels. England found that the difference in cost between temporary and permanent construction, taking into account the application of the necessary utilities, made it wasteful to build in other than permanent fashion. Where the temporary structures are erected, their demolition should be made mandatory, since experience demonstrates that such structures develop into slums, as Galveston and San Francisco will bear witness.

E. Rentals.

Rentals should be calculated by taking into account local conditions and without direct relation to the cost of

*Submitted at a joint meeting of the American Federation of Labor and the Section on Housing, Committee on Labor, Advisory Council of National Defense, by Charles Harris Whitaker.

the houses. The lowest rental consistent with conditions will prove a large factor in establishing labor contentment.

F. Facts to be Ascertained as Necessary to a Decision in Respect to C1, C2, C3, D1, D2, D3, D4, and E.

(1) Number of employees to be housed; (2) probable accessions; (3) number required for war emergency only; (4) proportion of men and women; (5) number of families and their range in size; (6) number of single men and women; (7) variations in race and character; (8) proportion of skilled to unskilled labor; (9) necessities for boarding houses; (10) necessities for providing meals only; (11) land available and its cost and relation to the service needed.

Each investigation should conclude with a suggested program covering:

A. In what manner funds can be utilized to the best advantage with respect to providing housing accommodations.

[NOTE.—Whether C1 or C2 is recommended, the plan of financing should be worked out. If C3 is advised, there should be definite suggestions as to D and E.]

B. The ability of the community to provide the necessary schools, public utilities, recreation, churches, and the usual community accessories which are vital to the success of any building operation. Where these are inadequate or lacking, they must be made a part of the program.

[NOTE.—England found it necessary to build schools, churches, halls, central kitchens, laundries, and other community services, as indispensable to the successful operation of her houses and the satisfaction of her workers.

It would be of the greatest value if these investigations could be made as quickly as possible, in order that they might all be compared at a general meeting, in order that each might have the benefit of the other's experience, and in order that a definite program might be put into effect with the least possible delay and with the greatest assurance of having been analyzed as carefully as the emergency permits. It must be remembered that we are on the verge of winter and that little time remains in which to rectify a situation which will be infinitely worse with the approach of cold.]

G. Central Administration.

There should be established a central authority in charge of every phase of the Government's relations to emergency industrial housing, preferably an independent commission.

No plans for houses, or subdivisions of land, or developments of properties in which the Government has any financial interest under such a program as has been outlined, should be permitted without the approval of the central authority.

Time is the essence of this program. It is impossible to overstress the necessity for taking the promptest action looking to the relief demanded by the necessity for speeding up production.

Industrial organization is the key to the duration of the war. The key to industrial organization is proper living conditions!

September 20, 1917.

Government Aid to Housing in War-Time—and After

By JOHN IHLDER
Secretary Philadelphia Housing Association

SIX MONTHS of war have already produced social and economic changes so great in the present, so much greater in their prophecies for the future, that all pre-war social policies must be tested anew. There is truth in the expression often heard at the National Conference of Social Work last spring, that the social problems of war are but an intensification of the social problems of peace, and that principles proved by long years of peace experience should still guide our action. But while principles remain the same, the intensification of our problems, their mere increase in size alone, make necessary new methods in dealing with them. And to size is added an almost feverish urgency.

In this addition lies our danger. Our problems must be dealt with, not only on an unprecedented scale, but immediately. Delay means such tremendous and immediate cost in life and treasure that we incline to close our eyes to any aftermath of possible mistakes. It is a time when men are prone to accept the Rooseveltian belief in quick decisions, even if nearly half the time wrong decisions. But decisions that are too far wrong can not be quick, no matter how hastily they are made, for they must be unmade. We have already had some notable instances. So before making quick decisions it is well to consider such evidence as is at hand.

In housing, the war has accentuated our problem, and especially along three lines. Along all of these lines the problem had been becoming more and more accentuated during the two or three years preceding the spring of 1917. So we have had some opportunity to study it in its new phases. These are:

1. A rapidly increasing concentration of population in existing industrial centers.
2. The creation, almost over night, of new industrial communities.
3. A rapid increase in the cost of building and of public services.

To these must be added, in many places, particularly the smaller ones, a spectacular rise in land values.

The stories of Bridgeport and of Flint are familiar and are typical of what is now taking place in many other industrial centers. Even Philadelphia, for all its size, has begun to feel the pinch. Two years ago it was overbuilt. Today it has few vacant houses for the wage-earner, and in some districts there is already overcrowding. Yet every day brings news of more factories and plants, of extensions to old ones. Meanwhile, the amount of new building construction is below normal. If present tendencies continue, and there is every evidence that they will unless energetic action is taken, Philadelphia must soon face conditions that will seriously threaten the health and strength of its wage-earning population. Like other old industrial centers it needs a firm enforcement of housing regulations. More fortunate than many, it has a housing code that, enforced,

will guard it against the worst conditions, but unless the provision of new dwellings keeps pace with the demand, it will face an impossible situation. This provision of new dwellings involves not only house construction but extension of sewer system and water mains, the draining of wet lands, road building.

The problem in new communities does not differ in kind from that in the established industrial centers except in the minds of those who have the making of decisions. They are prone to believe that old methods which have provided wage-earners' housing in established communities will prove equal to the present emergency, forgetting that higher costs of materials and labor have a deadening effect upon an industry whose product is not used up at once but continues to exist over a long series of years, during the greater part of which it may have to compete with newer buildings more cheaply erected. Nor do they, or any others except those directly concerned, yet realize the havoc that has been wrought in some of our city departments by the drafting of the younger men. Munitions makers are exempted for they stand directly behind the men in the trenches. But back of them stand the men whose work means the maintenance of public health. In the newly created communities all this is clear. Where there are no houses it is obvious that houses must be built. Where there are no sewers or water it is obvious that these must be provided. But in the established communities it is assumed that such things grow of their own accord.

In the old days before war booms we had methods of securing these essentials that promised to be adequate, methods the very slowness of achievement of which was an argument in their favor in a democracy where the people should be convinced before being compelled, methods which in spite of their slowness still bade fair to outstrip the evils against which they were applied. But now, with our hothouse growth, with the minds of the people distracted from a study of social problems at home by the great drama abroad, we are in danger of permitting evils to develop so fast that it will be impossible to rectify them, even after the return of peace. As it is, the needs of the National Government that are bringing these conditions about, upon the National Government must be put the chief responsibility for checking them so far as possible. This it can do in three days.

1. With every contract should go a requirement that the men who work on that contract be properly housed. In peace times the progressive community that sought to secure new factories made much of its advantages for the worker; the more progressive manafacturers gave some consideration to the way in which their employees would be able to live. The National Government has a greater interest in the worker than has the employer. It can not discharge its broken-down citizens. An evidence of this interest would stimulate the communities that thrive or hope to thrive on war contracts. It would be tangible evidence that the maintenance of public health is also service to the nation.

2. The Federal Government, state and municipal governments should make capital for house-building available at low rates of interest. The Federal Government now is advancing the money for the building of factories. If there are not proper dwellings for the workers within reach of these factories, money for the erection of such dwellings also should be advanced.

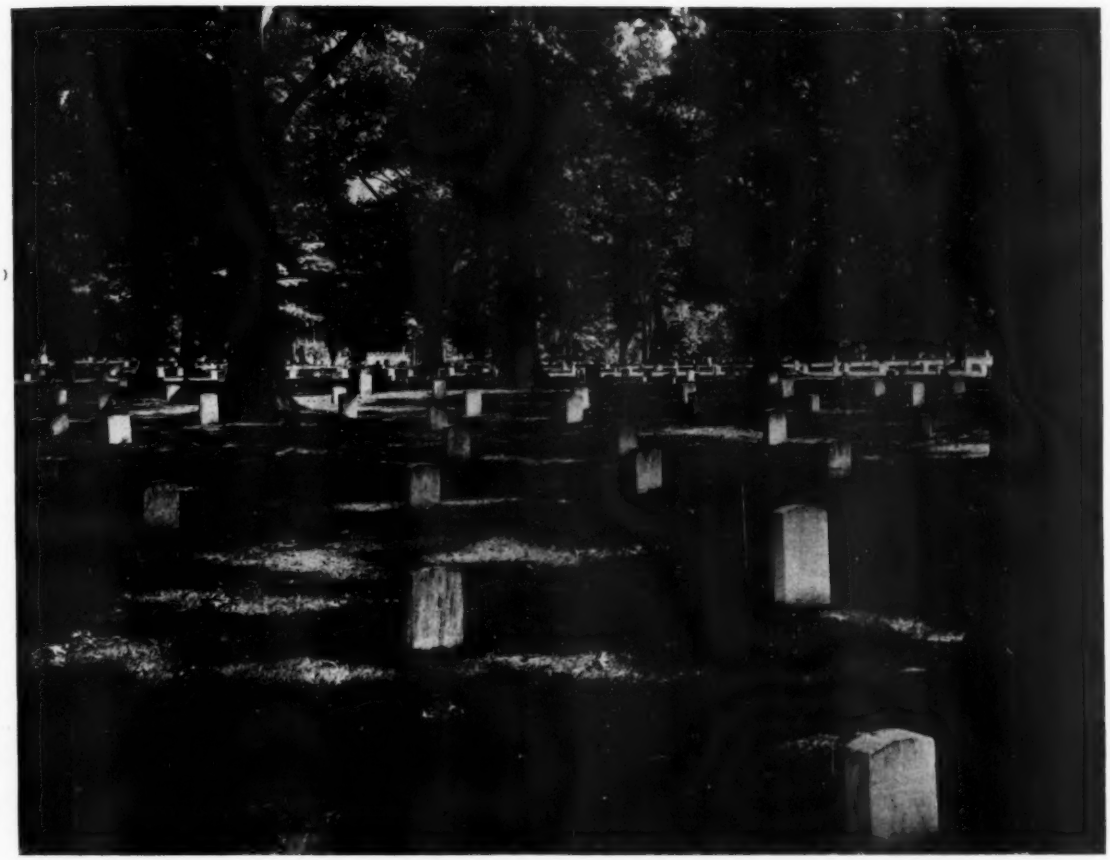
In both the requirements to accompany contracts and the advance of capital for house-building, the Government should set definite minimum standards that must be met. For these houses will long outlast the war, and, both themselves and through their influence on succeeding developments, will affect the lives, not only of the present generation, but of succeeding generations. Moreover, the capital advanced should be surrounded by proper safeguards. We are dealing with an emergency, but what we do now is sure to establish precedents, good or bad. There should be three rules: the interest rates be such as will protect the Government against loss; the use of the money be given only to those who can be held responsible and who are bound not to make large profits; repayment be made in regular instalments over a long period of years.

Recognizing, as we perforce must, the abnormal cost of building at present, the Government might, until it has made good on the third suggestion, charge off a part of the cost as a war cost, leaving the amount to be repaid smaller than the actual investment. This, of course, presents practical difficulties. How much shall be so charged off will be a question, and it will be a separate question in each community, for in each the effect of the war upon building costs has differed. Consequently, it behooves the Government to undertake as quickly as possible the task of setting prices for building materials.

3. We are now setting prices for wheat and coal and iron. If we are to have enough houses for our army of workers we must set prices for brick and lumber, sewer pipes and water mains. Stability, some assurance for the future, is even more essential than a considerable reduction, important as that is, for work is now being held up because men dare not buy at today's prices for fear next week's may be lower and they be put at a ruinous disadvantage.

Speculative rises in land values have an even more definite effect upon housing than does an increased cost of materials. The ideal family dwelling is the detached small house with comfortable open spaces all around it. Every rise in land values makes approximation to this ideal more difficult. Where this rise is due to industrial activity based upon Government contracts, it would seem as fair a subject for conscription as the excess profits of munitions makers. An unearned increment tax taking all or the greater part of this rise would tend to check the rise—an advantage of the first magnitude from the housing point of view—and would supply funds for sewer and water extension and road building.

In our present emergency we are doing things that a year ago would have received scant consideration. Many of these we believe are temporary; with the return of peace we shall revert to old methods. But in no case can we be sure. All we can be sure of is that some of these emergency policies will become permanent. So, engrossed as we are now with meeting present needs, we should give some consideration to possible permanent results. Governmental advances of capital for house-building has long been practised in Europe, and was strongly advocated here before the war. It will meet an immediate need and, properly safeguarded, should be continued after the return of peace.



An Undisturbed Section Showing the Peaceful Effect Produced by Stones of Uniform Size and Color

New Plans for Arlington National Cemetery

By CHARLES MOORE

AUGUSTUS SAINT GAUDENS made his direct contribution to the report of the Commission of 1901 on the Improvement of the Washington Park System in the shape of six paragraphs dealing with Arlington National Cemetery. That report recognized the fact that by the construction of the contemplated Memorial Bridge, Arlington and Fort Meyer would become a portion of the park system of the Capital.

"Nothing," wrote Mr. Saint Gaudens, "needs proper supervision and planning more than the modern cemetery. . . . Instead of being a place to which one may go with a feeling of respect and peace, as into a church or sacred place, the eye and the feelings are constantly shocked by the monstrosities which dominate in all modern cemeteries.

"There is no doubt that the feeling which pervades the majority of people who erect monuments to their dead is of the tenderest; a sincere desire to do nothing even in the simplest form which is not fitting and in entire harmony with the feeling that prompts the erection of the memorials. This feeling, if properly protected and guarded, would lead to the harmonious and sober treatment so necessary in such places.

"A great example of the effectiveness of such restraint and guidance is the extraordinary dignity, impressiveness, and nobility of the cemetery at the Soldiers' Home and also in that portion of Arlington Cemetery set apart for privates

Example of the Confusion Created by the Intrusion of Heterogeneous Monuments in a Once Quiet Section

A Supreme Case of the Spoiling of the Soldiers' Quarters in Arlington

THE TOMB OF PETER CHARLES L'ENFANT, ERECTED IN ARLINGTON BY THE AMERICAN INSTITUTE OF ARCHITECTS. AN EXAMPLE OF QUIET DIGNITY

TYPICAL MONUMENT FOR ARLINGTON NATIONAL CEMETERY. FURNISHED TO THE SECRETARY OF WAR BY THE COMMISSION OF FINE ARTS. Designed by McKim, Mead, and White

TYPICAL STONE FOR ARLINGTON NATIONAL CEMETERY. FURNISHED TO THE SECRETARY OF WAR BY THE COMMISSION OF FINE ARTS. Designed by Charles A. Platt

TYPICAL MONUMENT FOR ARLINGTON NATIONAL CEMETERY. FURNISHED TO THE SECRETARY OF WAR BY THE COMMISSION OF FINE ARTS. Designed by Charles A. Platt

and unknown dead. This is not attained by any large monuments, but by the very simplicity and uniformity of the whole.

"The trouble is that the majority of the monuments now in the cemeteries are produced by firms who make it merely a business affair. To remedy this it is absolutely necessary that the designs of all monuments, from the most modest

ANOTHER UNDISTURBED SECTION SHOWING THE PEACEFUL EFFECT PRODUCED BY STONES OF UNIFORM SIZE AND COLOR

to the most costly, should be subject to the approval of a commission composed of two or three architects and a landscape architect of the highest possible standing. They should lay out and design the cemeteries and establish rules for their proper supervision, and should control designs for future monuments in the cemeteries now existing.

"Nothing could be more impressive than the rank after rank of white stones, inconspicuous in themselves, covering the gentle wooded slopes [of Arlington] and producing the desired effect of a vast army in its last resting-place. Those spaces reserved for burials of officers, however, exhibit all the heterogeneous forms which disturb those very ideas of peace and quiet which should characterize a spot sacred to the tenderest feelings of the human heart.

"In particular, the noble slopes toward the river should be rigorously protected against the invasion of monuments which utterly annihilate the sense of beauty and repose. This is one of the most beautiful spots in the vicinity of Washington; it should not be defaced or touched in any way, and a rule or law should at once be passed forbidding the placing of any monuments on this hill."

No one of the pilgrims to be found, on any day, seated in contemplation of the memorial designed by Mr. Saint Gaudens in memory of Mrs. Henry Adams, in Rock Creek Cemetery, Washington, will question his authority on such a subject.

There is another more prosaic consideration. The admission to Arlington of any kind of a monument offered produces in this cemetery the domination of wealth as well as of bad taste. In a place where such distinction as is permitted should be governed by quality of service to the country, both wealth and favoritism vie with

A Noble Slope Badly Disturbed and Defaced

eccentricity in forcing the attention of the visitor. So strong are these influences that they have already invaded even the soldiers' portions, so that the well-ordered ranks have been broken by replacing the simple stones with others which are marvels of bad taste. The effect is similar to that which would be made by permitting some of the soldiers on parade to appear in the nondescript garments of civil life.

Moved by the spirit of Mr. Saint Gaudens' forcible comments, the Commission of Fine Arts approached the Secretary of War, the Quartermaster General, and the officials directly in charge of Arlington. The response was immediate and in entire sympathy with the objects in view.

Rules have been promulgated limiting new monuments to 5½ feet in height and 7 feet in length, and providing that the designs shall be submitted to the officials before permission is given for their erection. Rock-faced and highly polished surfaces have been forbidden. Moreover, further substitutions in the soldiers' quarters are not permitted in cases where such changes would disturb the present good order. As was to be expected, these rules have brought forth objections from persons who desire the display of individuality or eccentricity or wealth, and sometimes, also, by well-intentioned people who do not or will not understand the spirit which has prompted the new regulations.

The Amphitheater now approaching completion will have crypts for the reception of the remains of those who have served their country in a signal manner, and hereafter there will be no excuse for conspicuous monuments. Probably the distinction of a place in this amphitheater will make it possible to free the slopes toward the river from the monuments which now deface them.

RIOTOUS CONDITIONS IN THE OFFICERS' QUARTERS AT ARLINGTON

The portions of Arlington occupied by officers' graves can never be brought into entire harmony. There is, fortunately, a considerable area to the east which has not even been plotted. In the midst of this area the remains of Admiral Dewey will rest. Here, then, is an opportunity to lay out a considerable portion of Arlington and to improve it along lines dictated by good taste, dignity, and respect. Moreover, the enormous increase in the Army, and the certainty that the present war will have its dire results, makes it imperative to provide a much greater area than is now available. The time to begin this work of planning and enlargement is now, before emergency causes hasty action and thereby forces bad results. The Government has undertaken to provide burial-places for its defenders. It should do so in such manner as to show due respect both to them and to itself.

The best practice of today minimizes the monument and emphasizes the landscape. By the use of native trees and shrubs the place of the dead is made quiet and peaceful. In the newer portions of Arlington the quiet of hill and vale, of wooded slopes and green plains, should be preserved that the cemetery may perform its true function as a resting-place for the warrior and also for those who would pay respect to his memory.

ST. GAUDENS' LINCOLN
Photograph copyrighted 1909 by J. E. Yoreman
Courtesy of the Commission of Fine Arts

BARNARD'S LINCOLN
Photograph copyrighted by the Perry Studio, New York

The Barnard Lincoln to Go to London

IN THE discussion aroused over the proposal to send to London a replica of the statue of Lincoln by George Gray Barnard, the arguments for and against have been nowhere brought forward with greater clearness than in the editorial columns of the New York *Tribune* and the Philadelphia *North American*. From these editorials we reprint, on the following page, such portions as are possible within the space limits at our disposal, although each argument is so carefully built up as to suffer somewhat by abridgment. While it is unfortunate that the writers' names are unknown, since the personal equation, as it rests upon a general attitude, should always be known in valuing a criticism, these two opinions are so synthetic of the general arguments which have been advanced as to lose less in their anonymity than would otherwise be the case. The British Parliament have now accepted the Barnard replica.

On Monuments

From the New York *Tribune*

In the controversy over the statue of Lincoln which it is proposed to erect in London, much heat has been expended in denunciation of Mr. Barnard's production as a portrait. This is natural and proper. The sculptor's uncouth conception of his subject offers a point of attack as vulnerable as it is obvious. But it is not by any means the only invitation to criticism. This episode revives in acute form the whole question of what we can only describe as artistic manners. These—if the testimony of civilized peoples in all ages is worth anything—are explicit on the dignity essential to a public monument. Consider the largeness, the grandeur, of every great statue that has really withstood the test of time. Consider the majestic, impersonal character of Greek sculpture and the severe stateliness of Roman, the nobility superadded to the realism of heroic statuary in the Italian Renaissance, and the measured, orderly style predominant in modern France. This uniform tendency through the historic schools has never been determined by any vulgar triumph of academic formulas over individual creative genius. It has expressed, simply, mankind's innate sense of things, the natural human conviction that a public monument, as distinguished from the statue in a private gallery or from the purely decorative work of art, should be, above all things, monumental.

We are not playing with words, bringing "monumental" forward as a sort of esoteric mumbo jumbo, behind which we might mean anything we chose. This particular word has not only a fixed meaning, but certain inalienable associations. The same lexicographer who defines a monument as "anything erected to perpetuate the memory of a person or an event," is careful to indicate that what is "monumental" is, among other things, "impressive," thus recognizing the eternal play of that universal instinct to which we have referred. How clearly the poets drive at this point! How consistently they portray their hero with an effort to detach him from his ordinary surroundings, to charge their every stroke with at once the truest and the loftiest meaning, to free the core of his character from petty details, to synthesize his traits and thereby to simplify them—to idealize him, in a word, and by virtue of so doing to make immediately comprehensible to the world, not alone his outward seeming, but the very soul of him.

It is, then, not alone because Mr. Barnard's Lincoln is revolting as a portrait that . . . the donor of the bronze, should . . . ponder, also, this large question of artistic manners, this principle of framing a public memorial with a decent respect for the opinions of mankind, for the unchanging traditions of a special form of art. He is known as a collector of old masters, a connoisseur of fine things. Let him, in that capacity, ask himself which statue comes the nearer to matching the Lincoln of Lowell's ode—Barnard's or the masterpiece by Saint-Gaudens in Chicago, a replica of which could surely be procured. Before which one of them will the people of Great Britain pause in recognition of the true representative of this country in the Civil War, set before them purged of all unimportant traits, made manifest in truly heroic mould—a figure not of Illinois and yesterday, but of America and all time?

Which Lincoln Shall We Send?

From the Philadelphia *North American*

If a Lincoln is to stand in the shadow of those venerable walls (London), by all means let it be Barnard's Lincoln. Not because it is Barnard's—but because it probably is the nearest possible approach to that rarest of achievements in imagery—the exposition in one figure of both the physical and the spiritual stature of the subject.

. . . . . .

If there is to be shown in the land of Magna Charta a likeness of the great apostle of freedom, let it be as nearly as possible a real one. . . .

For if ever there lived a man who hated even the small and commonly overlooked deceptions, that man was Lincoln. It would be hard to conceive a personality more free from any desire to look or seem what it was not. Indeed, it is one of the bases of his greatness that he had no affectation of voice, glance, or manner. The very essence of his nobility is to be found in his own complacent acceptance of his gnarled physical nature. It was this as much as anything else that lent force and power to him.

. . . . . .

Already the world is overweighted with sand-papered "ideal" effigies of men and women whose work and worth make them worthy of such perpetuation. . . .

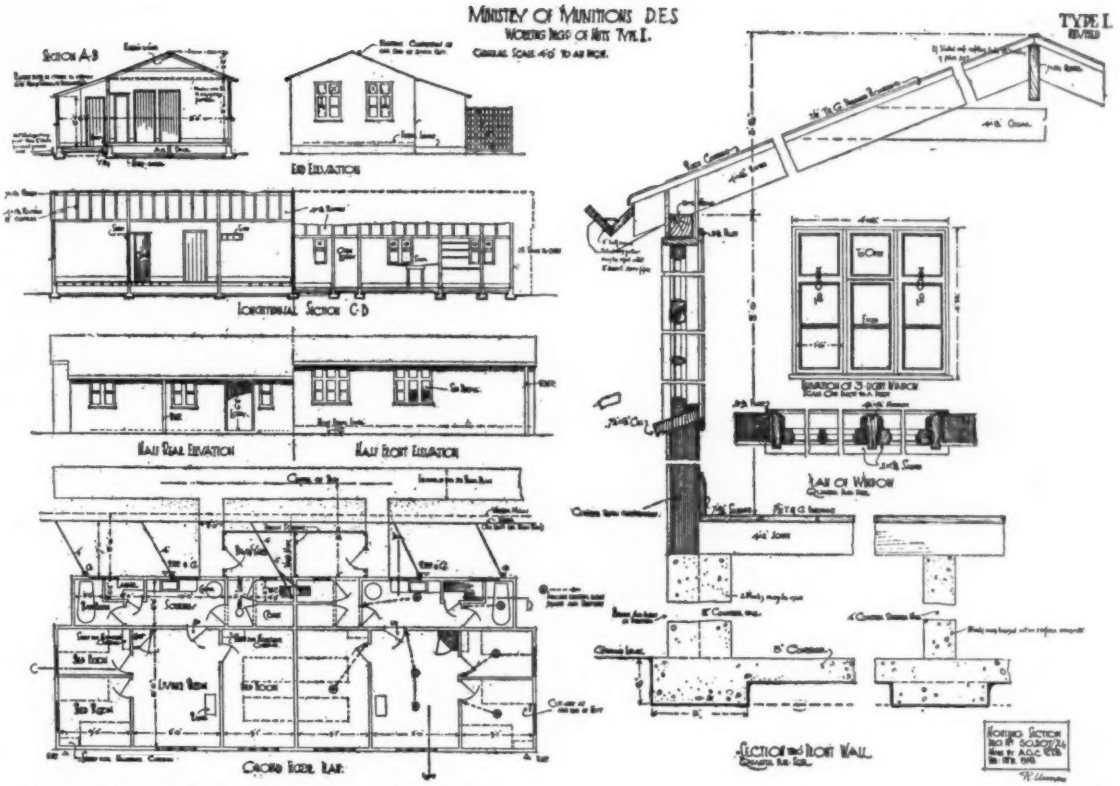
Why any American should—how any American could—object to the setting up in other lands of this real likeness is not easy to understand.

If it be that the showing of big bony hands, broadened and toughened by grasping the ax and lifting heavy burdens, should displease peers whose manual digits are soft and tapering, let it be remembered that most of the common people Lincoln loved and blessed are themselves possessed of hands akin to this kind and that their hearts must be quickened and their souls uplifted by the sight of such in one whose name is immortal. . . . . .

If the idea of these objectors is to export some fictional figure expressive of freedom, let them plead for an idealized Goddess of Liberty, which will mean just as much in front of the houses of Parliament as it does on the quarters and halves and dollars of our national currency. But if we are going to send a Lincoln to voice silently the meaning of freedom, let us send that Lincoln who lived its meaning and through whom the God of freedom made manifest to mankind the essentials of democratic personality.

The very fact that Barnard's Lincoln does accentuate the homeliness and soul-kinship of the man is the best argument in behalf of its selection for this purpose. It is that which makes of this unique likeness an inspiring and enthusing influence. For a majority of those who will pause before it in London will be homely men, and made more so by years of toil and struggling. And these may be led by this Lincoln to a larger, truer estimate of their own and their children's possibilities. . . .

On that face and in that figure, as Barnard has preserved them for all time, is written enough to tell the most ignorant peasant something worth knowing about the humanity of democracy. If this is not the purpose behind such a gift, then let the gift remain ungiven. And if there be any higher purpose, let some spokesman step forth to outline the manner in which it may be expressed.



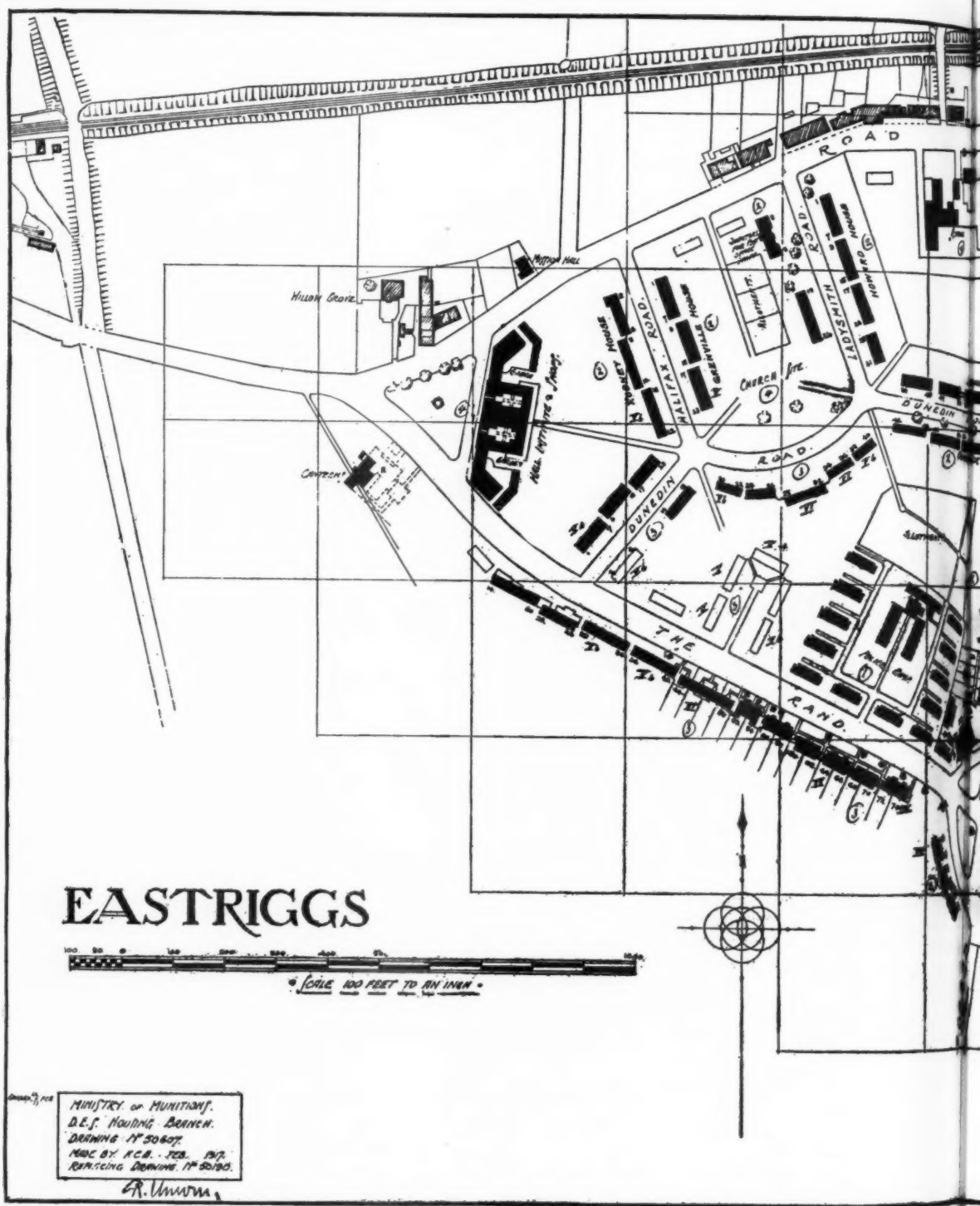
CLASS 1, TYPE I. TEMPORARY HUT FOR TWO FAMILIES — EASTRIGGS

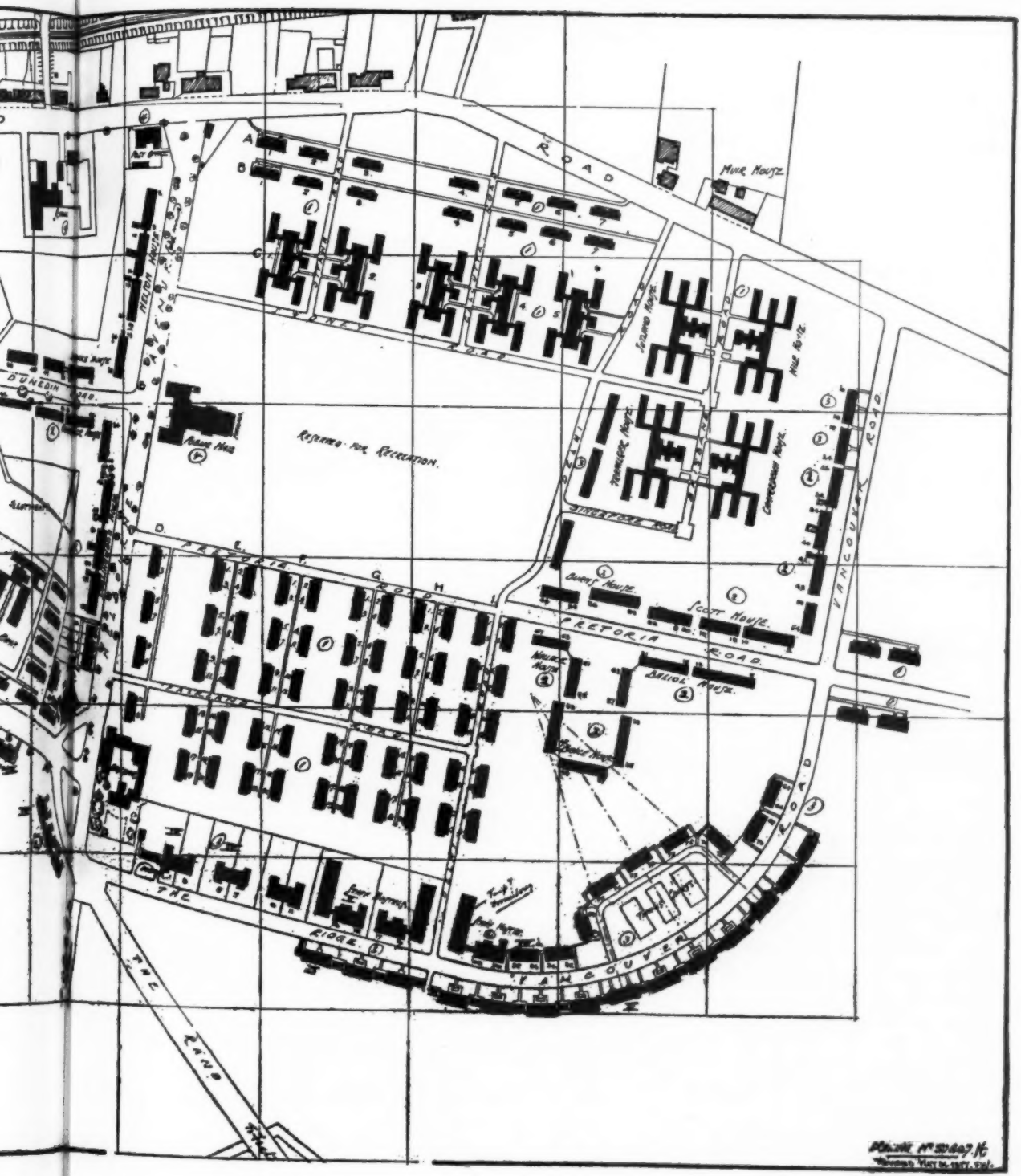
Eastriggs

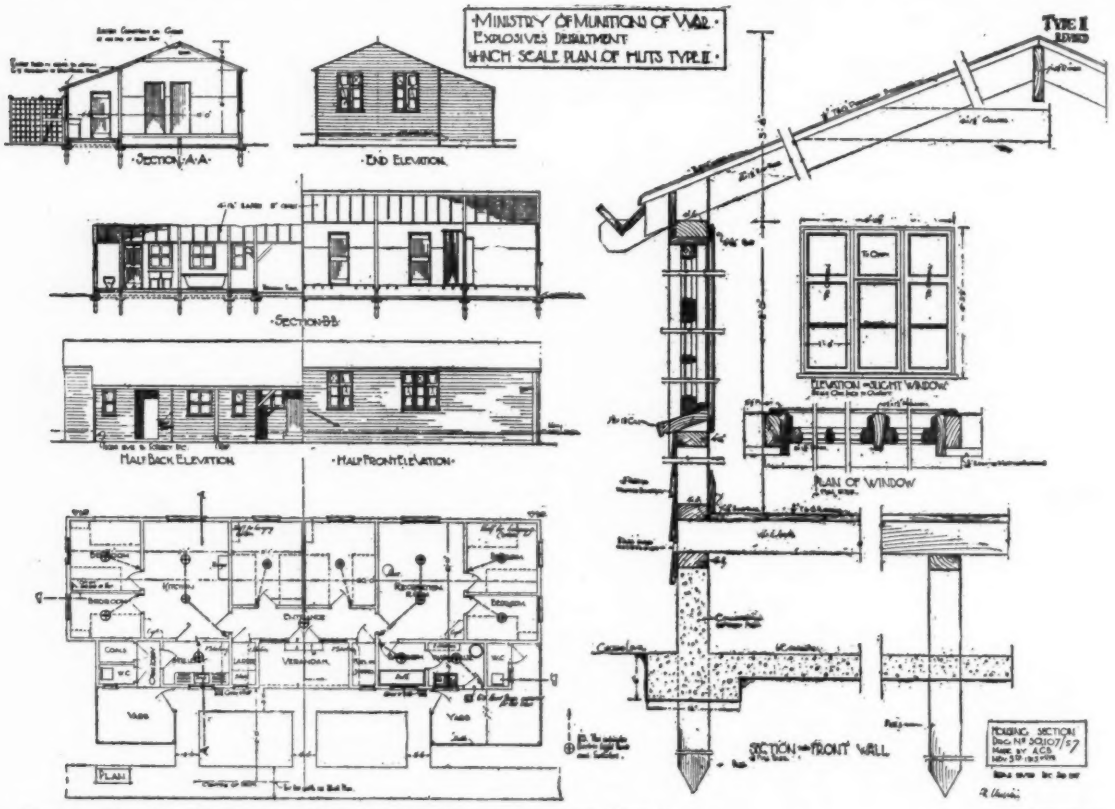
AN INDUSTRIAL TOWN BUILT BY THE BRITISH GOVERNMENT

EASTRIGGS is another of the British Government's housing operations and of quite a different character from Well Hall, illustrated and described in the September Journal. Whereas Well Hall consists entirely of permanent dwelling houses, Eastriggs consists also of temporary and semi-temporary huts, permanent cottage shells temporarily connected and used as hostels, and temporary hostels of various sizes. Altogether, the buildings are of four classes: (1) Huts, (2) cottage shells used as hostels, (3) completed cottages and staff houses, (4) shops, schools, churches, recreation buildings, and other accessories of a small town.

The huts of Class 1 include all buildings of temporary or semi-temporary character, built of concrete in blocks or slabs and wooden framing covered with stucco or weather-boarding on the outside and lined with wallboard or asbestos sheets on the inside. These huts are of three types: (I) Pairs of semi-detached family huts each having three bedrooms, living-room, scullery, bath, and other accessories. (II) Small hostels containing ten beds, which may be used for single lodgers or for a family taking in lodgers. These are readily converted into Type I and are very popular, being used by operatives, members of the staff, and often as larger houses by officials of higher grade. (III) Large hostels in which about 100 single men or women may be lodged, either in open dormitories or in dormitories fitted with cubicles. Inability to fix hours or prescribe the character of occupancy soon developed great objection to the use of these large hostels, and many of them are today


EASTRIGGS
SCALE 100 FEET TO AN INCH
MINISTRY OF MUNITIONS.
D.E.S. HOUSING BRANCH.
DRAWING No 50607.
MADE BY H.C.B. FEB. 1917.
REVISING DRAWING No 50/90.
E.R. Unwin.
HILLOW GROVE
MILTON HALL
COTTAGE
GREY
HALIFAX ROAD
DUNEDIN
CHURCH
ROAD
THE


ROAD
MUIR HOUSE
RESERVED FOR RECREATION.
DUNEDIN ROAD.
PRETORIA ROAD.
SCOTT HOUSE.
VANCOUVER ROAD.
THE RAND



CLASS 1, TYPE II. TEMPORARY SMALL HOSTEL CONVERTIBLE INTO TYPE I EASTRIGGS

only partially occupied, even in the face of serious congestion in the locality.

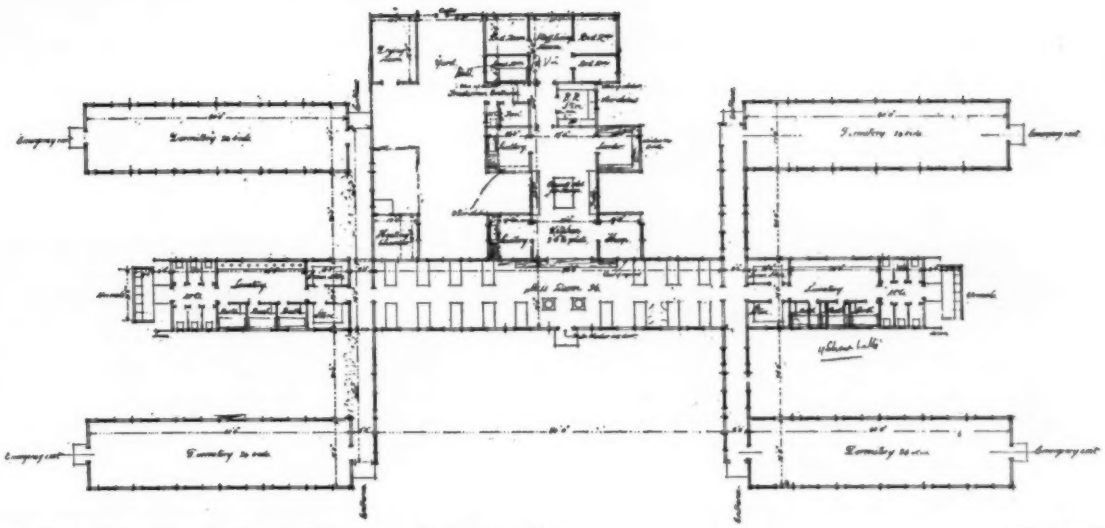
Cottage shells temporarily used as hostels, Class 2, can easily be converted into permanent family cottages. These were adopted because it was found that the cost of temporary buildings as described under Class 1, was, after taking into account the necessary expenditures for water-supply, drainage, and road-work, so little less than that for permanent buildings that it was poor economy to erect temporary houses except only where urgence of the short time available demanded it.

These hostels usually consist of groups of three blocks of four cottages each, the blocks being connected with temporary corridors and arranged either in a row or around three sides of a quadrangle.

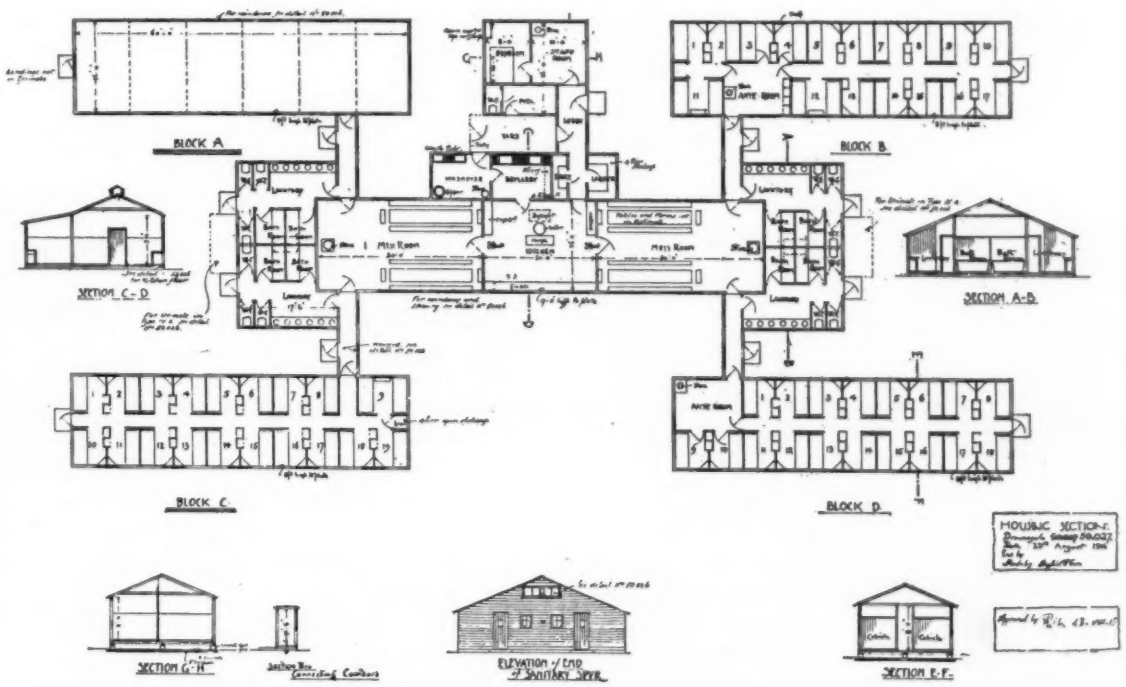
The completed cottages and houses, Class 3, are quite similar in plan and construction to those of Well Hall, which were illustrated in the Journal last month.

Under Class 4 are included such buildings, outside of actual houses and dormitories, as may be needed for the life of a community center. These were built as part of the housing scheme where the adjacent already existing town did not conveniently provide them. In this class are included not only schools, churches, and recreation buildings, but shops, bakeries, laundries, and central kitchens.

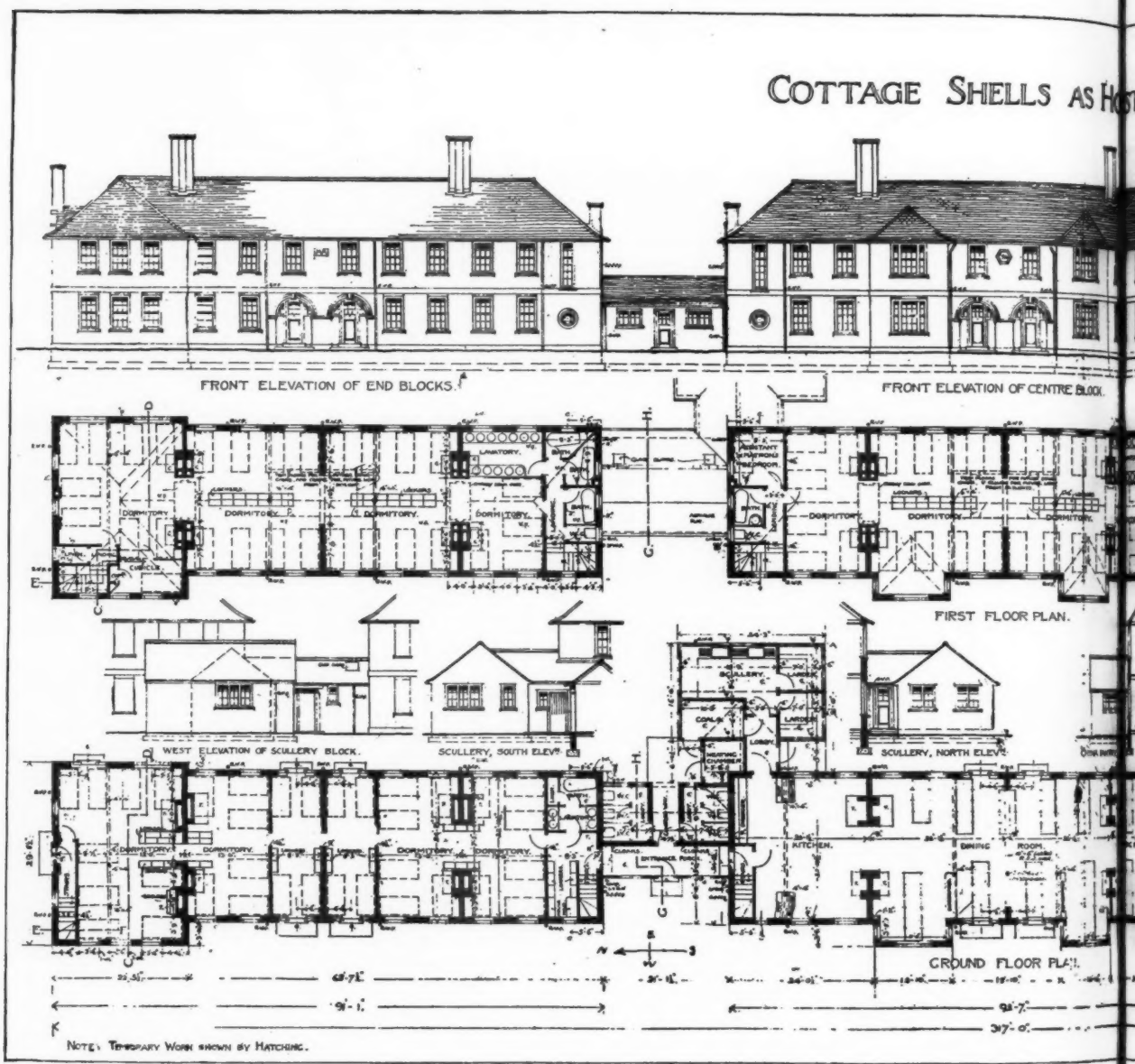
It is very interesting to note that even the most temporary of the Eastriggs buildings, as shown in the illustrations of the Class 1, Type I, huts, although they are simpler in design, will compare very favorably in construction with permanent small houses of the cottage and bungalow type in this country, and are even better than many of these.



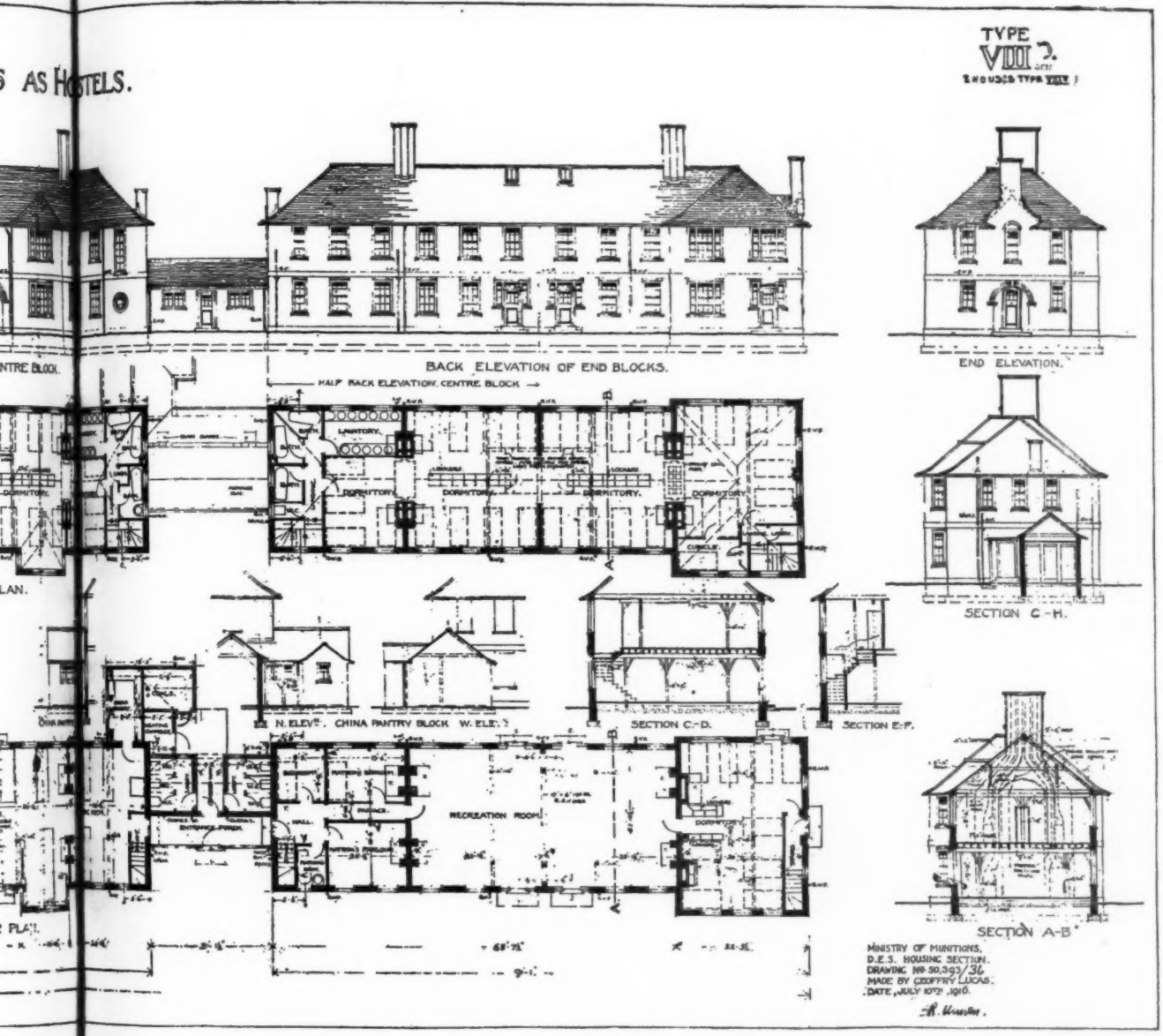
CLASS I, TYPE III. TEMPORARY HOSTEL FOR NINETY-SIX MEN — EASTRIGGS



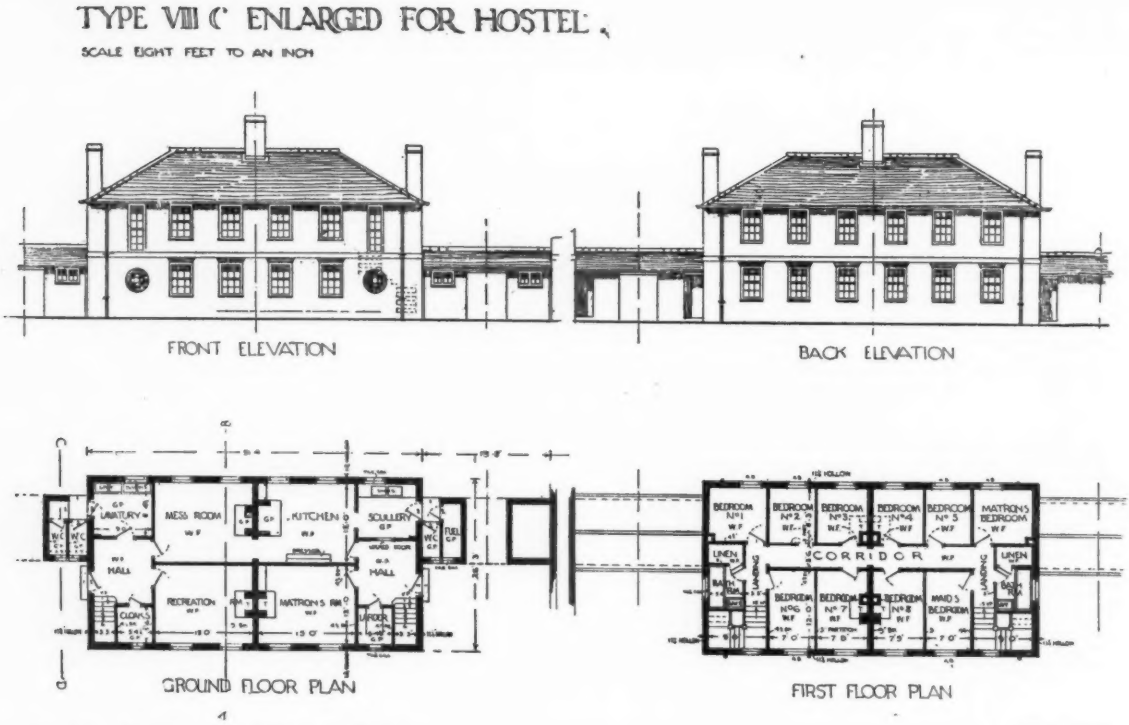
CLASS I, TYPE III. TEMPORARY HOSTEL SHOWING FOUR ALTERNATIVE ARRANGEMENTS OF CUBICLES — EASTRIGGS


COTTAGE SHELLS AS HOS
FRONT ELEVATION OF END BLOCKS.
FRONT ELEVATION OF CENTRE BLOCK.
FIRST FLOOR PLAN.
WEST ELEVATION OF SCULLERY BLOCK.
SCULLERY, SOUTH ELEVN
SCULLERY, NORTH ELEVN
GROUND FLOOR PLAN.
NOTE:- TEMPORARY WORK SHOWN BY HATCHING.

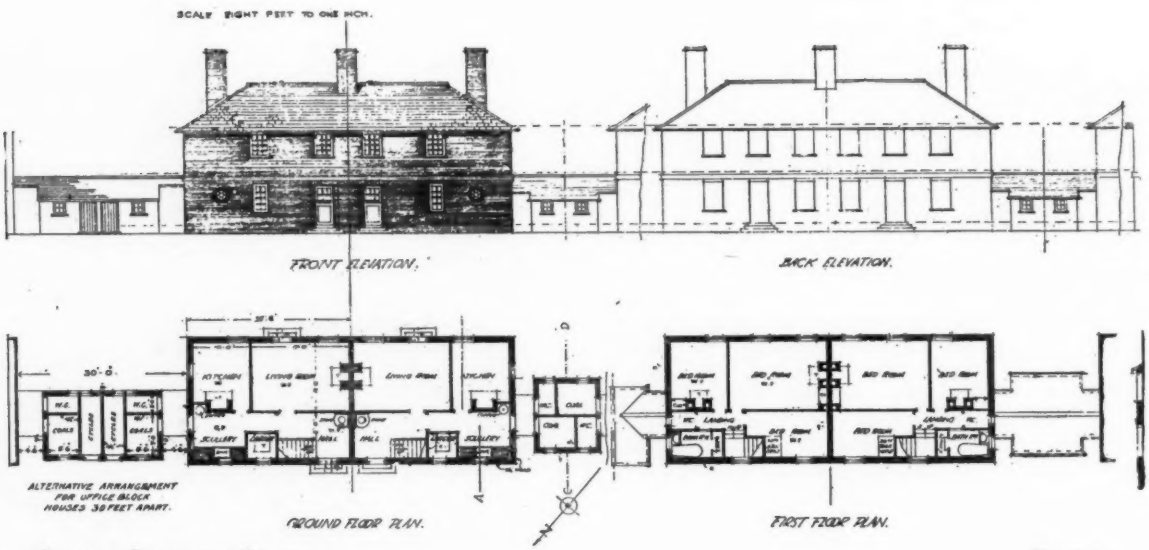
CLASS 2. COTTAGE SHELLS USED AS HOSTEL


TYPE VIII.
BACK ELEVATION OF END BLOCKS.
HALF BACK ELEVATION, CENTRE BLOCK
END ELEVATION.
SECTION C-H.
SECTION C-D.
SECTION E-F.
SECTION A-B
N. ELEVN. CHINA PANTRY BLOCK W. ELEVN.
RECREATION ROOM
MINISTRY OF MUNITIONS.
D.E.S. HOUSING SECTION.
DRAWING No 50,393/36
MADE BY GEOFFRY LUCAS.
DATE, JULY 10TH 1916.

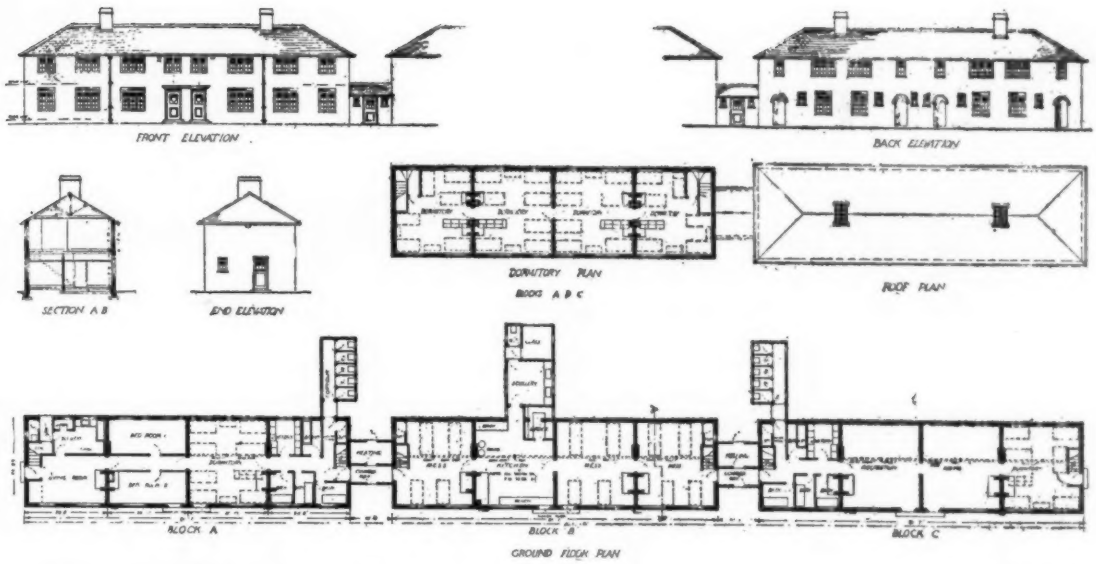
EASTRIGGS



CLASS 2. COTTAGE SHELLS USED AS HOSTELS — EASTRIGGS

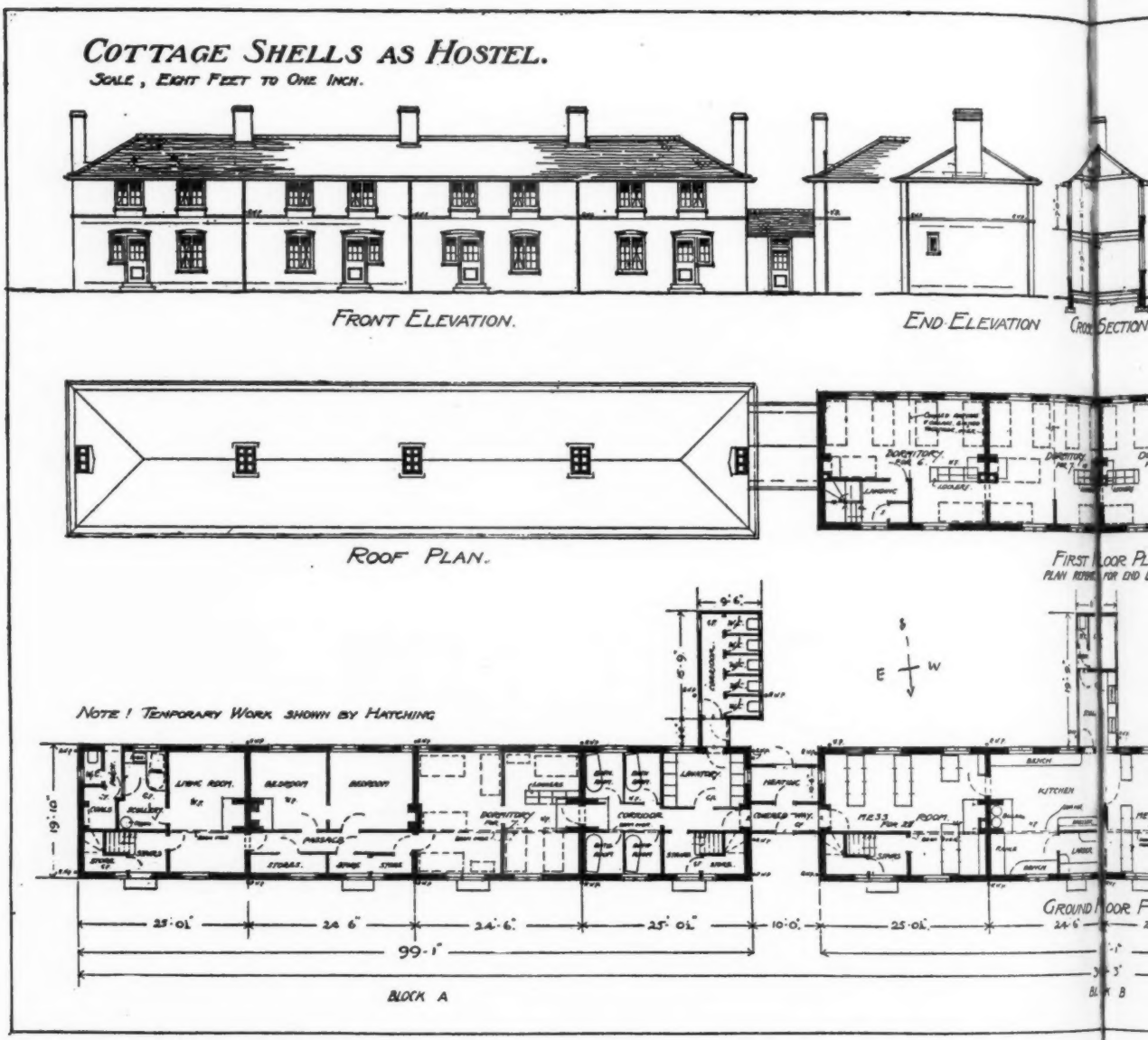

SCALE EIGHT FEET TO ONE INCH.
FRONT ELEVATION.
BACK ELEVATION.
ALTERNATIVE ARRANGEMENT FOR OFFICE BLOCK HOUSES 30 FEET APART.
GROUND FLOOR PLAN.
FIRST FLOOR PLAN.

CLASS 3. PERMANENT COTTAGES — EASTRIGGS



CLASS 2. COTTAGE SHELLS USED AS HOSTEL — EASTRIGGS

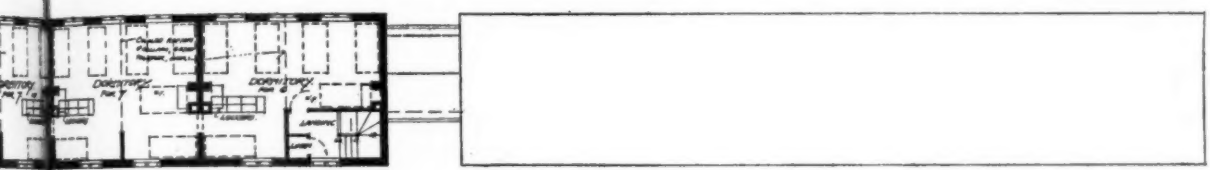
CLASS 3. PERMANENT HOUSES — EASTRIGGS



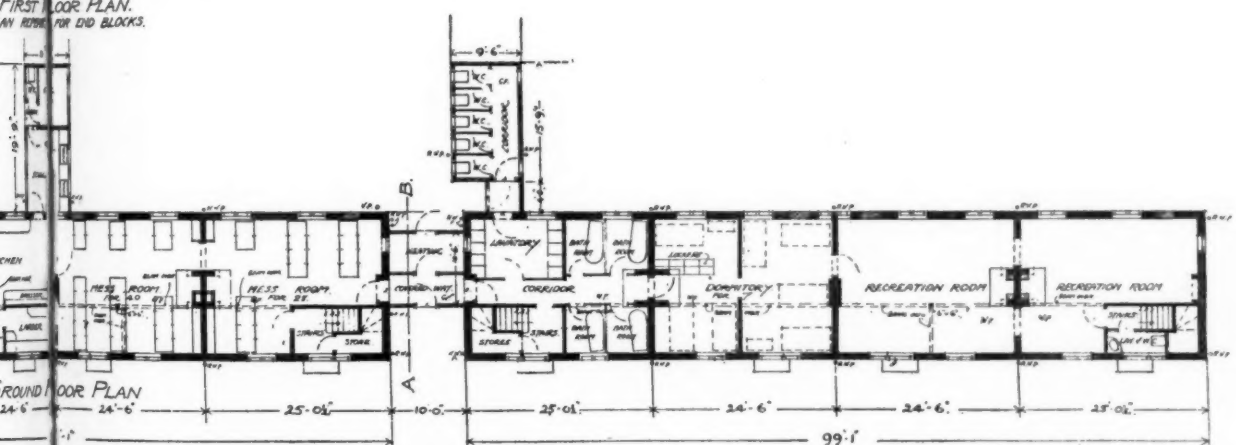
CLASS 2. COTTAGE SHELLS USED AS HOSTEL

TYPE VB.

CROSS SECTION. SECTION A-B. BACK ELEVATION.



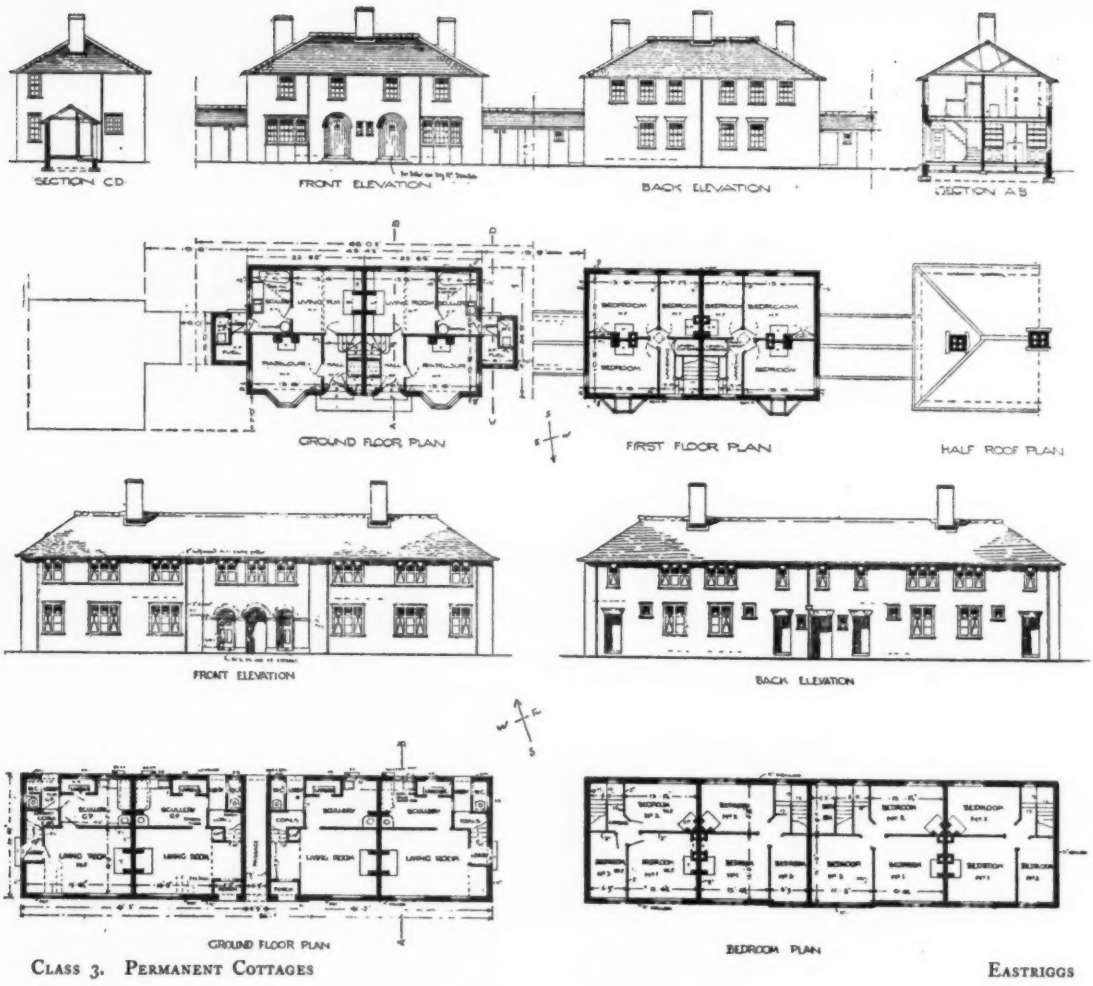
FIRST FLOOR PLAN.



GROUND FLOOR PLAN

MINISTRY OF MUNITIONS.
D.E.S. HOUSING SECTION.
DORMITORY FOR 50 & 6 O.R.'S.
MADE UP AS ONE CENTRE LOUIS
REVISED AUGUST 31ST 1916.

EASTRIGGS



CLASS 3. PERMANENT COTTAGES

EASTRIGGS

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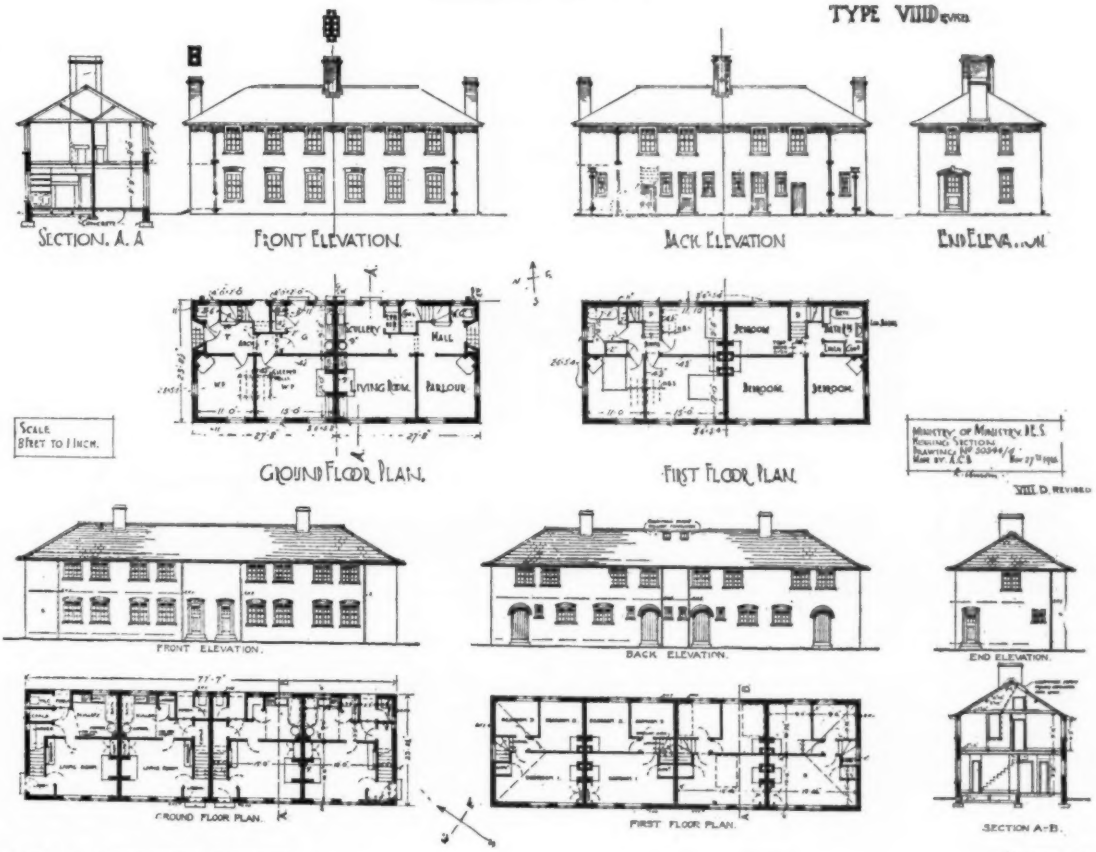

CLASS 3. PERMANENT COTTAGES — EASTRIGGS

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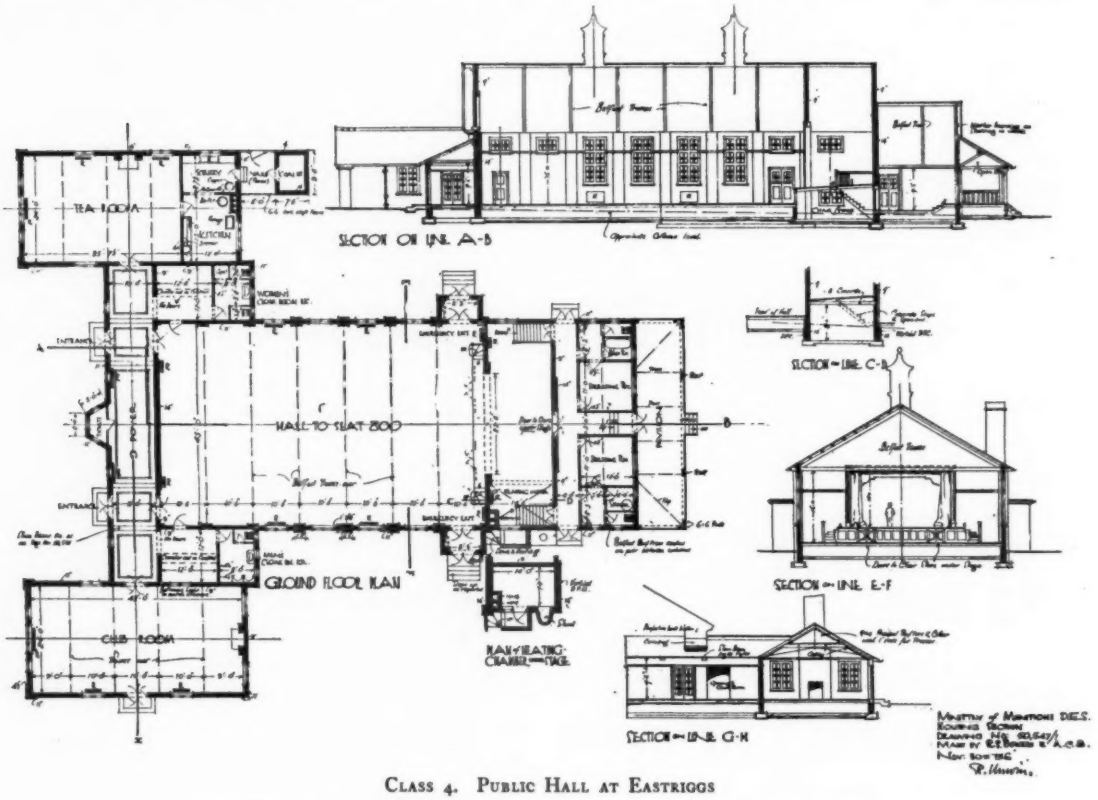

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Architecture and Civilization

AT the Sixth Informal Conference of the Royal Institute of British Architects on the subject of education, there took place a discussion which bears no less lightly upon the problem in the United States than upon that in England. The war has accentuated that slow dawning perception of the whole problem of education as applied to both the practice and the enjoyment of architecture, or to anything else, for that matter, for the world is now commanded to think as never before. Under the influence of this stern and well-deserved edict, by the rays of that light which is now borne homeward and heartward from the flaming path of death and destruction, shall we not first of all decide forever to relegate to oblivion that pompous, snobbish, supercilious phrase "Educating the Public"? Shall we not, on the other hand, approach the problem of our own education with a renewed appreciation of our careless ignorance, and in seeking to revitalize our educational system, let us be humble and admit that we are only students, even the wisest of those who look patronizingly upon their less "educated" fellows. No man who has not braved the mechanistic hell of modern warfare ought ever to dare again to look contemptuously upon that great public which, lacking though it may have been in an appreciation of even the least of the arts, has given evidence of its sublime courage in defending those things in which it has had only the minor share.

From the discussion to which we have referred, we reprint the following from the Journal of the Royal Institute of British Architects:

MR. W. E. VERNON CROMPTON [*F.*]: * * * * *

The relation of civilisation and architecture is one of cause and effect: the intellectual life or civilisation will give the intellectual architecture. The sensuous life will produce the sensuous art, and so on. If the architecture of the present time is anarchic it shows that the civilisation of our time has muddled ideas and an irrational way of thinking. To seek to improve the architecture of this country by improving the education of architects is excellent as far as it goes, but it is a more essential if less obvious duty, not only as citizens but as architects, to put our energies into altering ideas about elementary and public school education and all those other matters which direct the currents of our civilisation. Only by so regarding things can we avoid the error of putting the cart before the horse.

Although the relation of life and architecture is one of cause and effect, it would be a mistake for us to consider that the condition of architecture in any country at any time is a *primary* effect of life or civilisation: it is merely a *secondary* effect produced by secondary causes. If we are dissatisfied with the condition of architecture and wish to get at the real reason for its lamentable state we must pass over these secondary relations, such as the influence of the competitive contract system, the decline of technique in the crafts, building for the purpose of profiteering and dividends, etc., upon architecture, and get back to those that are primary. This is what I shall try to do. * * *

If we wish to have a clear idea as to what is wrong with architecture at its root we must cease to confine our discussions to styles, education, or æsthetics, the disorder of our streets, sound building, etc., for to do so would be merely to consider effects, leaving causes untouched. That which has thrown architecture off its balance is synonymous with that which has dislocated our civilisation.

As architects in search for this economic cause, let us recall to mind the nature of eighteenth-century civilisation. We see there the gradual extinction of an aristocratic class with the power and wealth, having a modicum of scholarship sufficient to keep alive a tradition which it was able to impose upon a people who had for the most part a definite status. Everything was homogeneous and oriented in the same direction: the means of the civilisation—as regards the art of building—were sufficient for the end in view. At the present day there is no aristocracy to speak of, but a plutocracy with no particular scholarship and no particular tradition: a plutocracy unable to impose anything but a stray fashion upon a common people who, in their turn, are mainly wage-earners, without status.

It is difficult to find a condensed and general formula to describe the economic cause for this change, a cause behind which it is not necessary, here and now, for us to go; but it may be sufficient to formulate the cause by saying that since the latter half of the eighteenth century man's control over certain physical forces has developed with extreme rapidity and at the expense of his powers in other directions. Hence the want of balance, the dislocation in our civilisation, and the chief reason—speaking in general terms—of the troubles we are discussing. Bergson, in *L'Evolution Créatrice*, touches upon this idea as follows: "Nos habitudes individuelles et même sociales survivent assez longtemps aux circonstances pour lesquelles elles étaient faites, de sorte que les effets profonds d'une invention se font remarquer lorsque nous en avons déjà perdu de vue la nouveauté. Un siècle a passé depuis l'invention de la machine à vapeur, et nous commençons seulement à ressentir la secousse profonde qu'elle nous a donnée. La révolution qu'elle a opérée dans l'industrie n'en a pas moins bouleversé les relations entre les hommes. Des idées nouvelles se lévent. Des sentiments nouveaux sont en voie d'éclore. . . . Elle servira à définir un age."

The economic situation arising from man's control over certain physical forces, developing with extreme rapidity and at the expense of his powers in other directions, coming as it did in a relatively sudden manner, resulted in giving great wealth to some and, as a consequence, poverty to others in directions where there had been no great wealth or abject poverty previously. Wealth accrued to a class of the community to whom the planning of Bath and Bloomsbury made no appeal; in whom the down-at-heel contrivance of modern life produced no jar.

Considered economically, wealth is power over the lives of others; considered also economically, civilisation is a method of distributing wealth. Understanding this will enable us to appreciate that herein lies the factor which brought about the gradual extinction of the aristocratic influence of the eighteenth century—the Bladesover tradition of Wells—that aristocratic tradition which gave us Bowwood and Prior Park, a tradition which can never return in spite of the hopes of some. Herein, also, lies the factor which has produced Holborn and the Strand, which has destroyed the craftsman with his status under the aristocrat and has given us the hand under the plutocrat. All this is of vital importance to architecture; but, judging from the amount of attention given to the subject by this Institute, it might not concern us at all. We have the means whereby an income of £50,000 can be accomplished, but we have not the means whereby it can be spent properly. We have the means whereby half a million can be earmarked for building, but we have not the means whereby to avoid sweating our labourers.

I do not overlook the fact that similar conditions have prevailed in civilisations which produced great art. But if the matter be studied in detail, I think you will find that the difference in degree between these present and past phases is so great as almost to amount to a difference in kind. All civilisations can withstand, and have withstood, the strain arising from unstable conditions up to a point; that point was passed in England early in the nineteenth century. Hence the result! Architects must grasp clearly and without evasion, shuffle, or compromise the nature of the economic cause which has produced the primary effect of dislocation which in turn produces the secondary effect upon architecture.

By all means let us hammer at the political administrators and the municipal authorities, but in nine cases out of ten you will find ignorant and unsympathetic ears and eyes, because they are the ears and eyes of those who from their elementary or public school life onward have not been bred to attach much importance to many of those things which, I trust, we in this room consider as vital to our survival as a great nation. The machinery is there to do a great deal, but not the knowledge or goodwill. The whole lump of things must be leavened, but the day has gone by when the upper portion of the lump can be leavened and the lower portion left.

Half a century of spade-work is ahead of us in a State at present but partly democratised, slow work with meagre results, before a foundation can be prepared upon which a civilisation can be raised which will not misbehave itself continually and be open to Professor Lethaby's just indictments. The aristocratic age is gone for good; in the democratic age before us we shall not be able to produce excellent architecture unless the people live an excellent life. It is, therefore, time for this Institute to lay aside its aloofness and to go down into the arena as a propagandist body anxious to ally itself with engineers, master builders, and trades unionists, having a lively faith which it should set forth in a tractarian literature thoroughly well written. We have spread ourselves very agreeably over the English Renaissance, the formal garden, and such-like important pleasantries; we should now voice our convictions not only upon the five or six excellent suggestions mentioned by Professor Lethaby, but also upon the relation of the architect and his work to all the vital economic problems by which we are being stifled.

Architecture for some time past appears to have slipped off the true line of the evolution of things, partly because great architecture cannot exist in an irreligious civilisation, but partly because we ourselves have shut our eyes to the reality of things.

The Royal Institute of British Architects Extends Its Hospitality to American Architects on War Service Abroad

To Members of the American Institute of Architects:

I beg to call your attention to the offer of hospitality extended to members of the Institute by the Royal Institute of British Architects, notice of which is conveyed in the following letter.

W. Stanley Parker, Esq.
Secretary,
The American Institute of Architects
Washington, D. C.

Dear Sir:

In sending you the letter from the Council of the Royal Institute of British Architects a few weeks ago expressing the satisfaction of the architectural profession throughout the British Dominions at the entry of America into the war, I was requested to write to you independently to offer the hospitality of the Royal Institute to American architects on military service who may find themselves on this side of the Atlantic and within convenient reach of London. I am to state that the Council has much pleasure in conferring upon them the privileges of membership of the Institute as far as the use of the Library and premises is concerned and the attendance at meetings and other public functions. The use of the Library would include the right to borrow books from the Loan Collection. The Council would be greatly obliged if you would kindly make this offer known to the members of the American Institute. I should add that it will always be a pleasure to the officials of this Institute to be of use to American architects and to render them every service in their power.

I am, dear Sir,
Yours faithfully,
G. Northover,
Editor Journal R.I.B.A., on behalf of the Secretary.

Any member of the Institute in military service abroad may be sure of finding a cordial welcome if he takes advantage of this thoughtful and gracious action of the Royal Institute.

Although it is not essential, as any means of identification will be adequate, I will be glad to furnish any member who so desires with a letter certifying his membership in the American Institute of Architects.

William Stanley Parker, *Secretary.*

Obituary

Robert Swain Peabody

Elected to Membership 1874; to Fellowship 1889.
President of the Institute 1900-1901.
Died, Peach's Point, Marblehead, Mass., October 3, 1917.

Robert Swain Peabody, past President of the American Institute, and the most distinguished of the older generation of architects, died at Peach's Point, Marblehead, on October 3. Mr. Peabody, apart from his skill as an architect, was a facile draughtsman, a great lover of the sea, and particularly happy in his ability to draw all that moved on the waters. It was peculiarly fitting that he should have died in the home he loved, on the shore of the picturesque harbor of Marblehead.

Mr. Peabody's career as an architect was so long and so varied that it is useless to attempt either to catalogue his works or to mention those most prominent in a list which covered every class of buildings from cottages to works of monumental size; nor would it help to explain the man and the artist. Much of the work which one fancies he loved best was unimportant from a worldly standpoint. As with all true artists, his love for his work meant often that his true personality and charm appeared most in work of small money value.

He was born in New Bedford, February 22, 1845, a son of the Rev. Ephraim Peabody who from 1846 to 1856 was minister at King's Chapel. His mother was Mary Lane Derby; so there was the best New England stock on both sides. He graduated from Harvard in 1866 and later served his alma mater fifteen years on the Board of Overseers and did most valuable service for the Department of Fine Arts and the School of Architecture. After graduation he studied in France and England and was among the early group of Americans who discovered for us the Ecole des Beaux-Arts—that school which has done so much to form and develop our power to design.

On his return in 1870 he associated himself with John G. Stearns, and that partnership was practically terminated only by the death of the two partners, for Mr. Stearns died the Sunday before Mr. Peabody. This firm then was active for nearly fifty years, and during this time, which was a most vital period in the growth of the profession, Mr. Peabody had been in many ways a leader, and always in the forefront of every movement toward better standards of design. He was a lifelong friend of McKim, and both were in that small group of architects who put the stamp of high achievement on the World's Fair at Chicago. The monumental group about the grand court marked a very clear step in the forward progress of the arts in the United States, and Mr. Peabody was a force in this great initial step.

It is sufficient evidence of Mr. Peabody's disinterested work for the profession he loved and for the arts he practised, to say that he had been not only President of the Institute and President of the Boston Chapter, but also for years the head of the Park Department of Boston, an unpaid position, and largely responsible for the report of the Committee on Public Improvements with its far-seeing suggestions and plans for transportation, the development of the suburbs, and the development of the port of Boston. Many of the projects then initiated he lived to see take form. Despite his seventy-two years he was before this last fatal illness a young man in every way, full of the joy of living, and a constant inspiration to all with whom he came in contact. When his serious trouble began, and he was for months recovering from an operation at Johns Hopkins Hospital, his vivid imagination carried him away to all the places he had known and sketched abroad, and he spent his convalescing days in drawing memory records, a set of sketches full of his characteristic vigor and executed with his sure touch. One mentions this because it is so characteristic of him and shows the true courage.

It was equally characteristic of him that, as soon as partial restoration to health made it possible, he resumed his duties in the Park and Recreation Department and this very spring put through important changes in the Common to recognize the great changes made in the State House by the addition of the wings.

He leaves a host of friends behind him, not only those who have passed through his office, but all artists who know him, who will always remember him for his buoyant enthusiasm, his joy in his profession, and his quick sympathy with all. It is not only his works which will live after him; his influence on others is even more valuable and more enduring.

R. Clipston Sturgis.

John Goddard Stearns

Elected as a Fellow, 1894

John Goddard Stearns died at Duxbury, Mass., September 16, 1917. He was born in New York City, May 18, 1843, but lived most of his life in Brookline, Mass. He was graduated with the Class of 1863 from the Lawrence Scientific School in Cambridge.

December 5, 1866, he married Ellen Elizabeth Abbott, whom he survived by less than a year. A son, Frank A. Stearns, associated recently with his father in his profession, and a daughter, Mrs. William H. Young, of Brookline, survive him.

Mr. Stearns had several years' experience in the office of Ware and Van Brunt. In 1870, in Boston, began his partnership with Robert S. Peabody, which, under the name of Peabody and Stearns, lasted for forty-five years.

Mr. Stearns' contribution to the firm and to his profession was of signal importance. His counsel in matters not strictly within his own chosen province, his sound business judgment, and his genius for quick decision and direct statement were always to be depended upon. He had not only the training of an engineer but also the true engineer's instinct that could "sense and overrule," and combined with these an appreciation of order and proportion in planning and design that made him the true architect as well. He was untiring in his attention to the superintendence of the many important works that his firm designed and constructed. He saw not only that the work

was going right, but also that it *did not go wrong*. He often said that the secret of successful superintendence was to know that something must be wrong, to find it, and to make it right.

His great service to the firm and to his profession lay in this insistence on the quality and thoroughness of the work done under his direction. The specifications, drawings, and contracts must be so complete as to enable him to carry the work through as designed without recourse to any other authority than the "documents." Such an attitude, simple and commonplace as it seems at present, required, fifty years ago, a marked change from the loose relations that had often, and perhaps as a rule, existed between architect and builder. Plans and specifications had generally been so incomplete that no one could say when they were complied with, much less insist on a high standard of performance. To make a firm stand and to insist that drawings and specifications should say what the architects meant and the owner was entitled to (and that only), and that what was thus set forth should be done, required thorough and expert knowledge of construction and of building materials and methods, a considerable degree of tact, and, above all, the power to insist on the right, which only an honest man can exert.

Mr. Stearns brought these qualities to his task. He was never willing to secure good work by asking it as a favor. He was a just man. He would always forgive an honest mistake and give freely of his time and advice to correct or overcome it. Builders and their assistants, as well as draughtsmen (many of them now successful architects), gratefully testify to the value of their experience with him as director and instructor.

Mr. Stearns was not so well known personally to members of his profession, especially in his later years, as many architects of lesser accomplishment. His home, his strong family affections, and his warm lifelong friendships made up his chief and absorbing interests.—F. A. K.

Joseph A. F. Cardiff

Elected to Membership, 1914
Died October 9, 1917, in New York City

In the death of Joseph A. F. Cardiff, the profession of architecture loses a man of singular capacity in his chosen field. Mr. Cardiff was born February 19, 1882, in Jersey City, N. J., and was educated in the public schools. He entered the profession through the office of Hugh Roberts, and, after years of increasing usefulness and power in the offices of Ernest Flagg and Carrére & Hastings, he became the business manager and associate of H. Van Buren Magonigle. During these periods he found time to write for the architectural magazines, to found and publish the architectural index on file at the Avery Library, Columbia University, and to render valuable service in committees of the Institute, the New York Chapter, and the City Club of New York.

He brought to bear upon his work an encyclopedic knowledge of building materials, appliances, and methods, a keen and analytical mind, courtesy, probity, and justice in all his relations to professional and private life.

H. V. B. M.

Henry Vaughan

Because for a long time it was my privilege to be employed and instructed by a very remarkable personage in American architecture, the late Henry Vaughan; and because, besides Mr. Robert Casson and Mr. John Evans (who always had his profound respect and friendship), I was one of the very few who came into intimate personal relations with him, I desire to utter a word of tribute to a man who succeeded in America notwithstanding his direct and intentional violation of American methods.

Henry Vaughan came to the United States as a stranger without friends, influence, money, or "pull," having given up a prominent, important, and remunerative position in England. He apparently buried himself in the two little rooms over the Criminal Investigation Department in Pemberton Square. He made no effort to get work; yet there was seldom a time when he did not have all that he could do. His attitude may be best explained by the following anecdote.

Filled with the American desire to "make things hum," I went to him once with advance information concerning a new church building, a "good job,"—and told him with pride and joy that some influential friends of mine had promised the office the first "show in," if he would make a preliminary sketch for the proposed building. I can remember now my disappointment and surprise when he merely replied, "Why, certainly not. If my work is good, and they want it, it will come to me."

His life was apparently lonesome in the extreme. From his rooms to his office, from his office to Marston's restaurant and back again, was practically his entire life. According to American standards it was dull, uninteresting, dreary. It was, however, full of a sweetness and richness which, while un-American, was still very good for America.

Although he himself spent practically every evening in his office, he never asked his draughtsmen to work overtime, no matter how great the pressure of work. Once, when I knew a set of drawings to be overdue, I expressed to him my willingness to come and work at night. He thanked me but declined my offer. However, determined to finish my own elevation at least, I returned to the office. I had hardly seated myself at my board before he appeared in the doorway saying with almost anger, "I told you not to come back." My explanation that I wanted to finish my own drawing caused a wonderful softening in his cold, steel-blue eyes; but, though thanking me, he said, "You scared him away." Some hours afterwards I heard him whisper from his private room, "Barton, come here." And going in, I found him at his board indeed, but not drawing. He was pushing crumbs from a roll (which he always brought from his dinner) out to a little mouse which, sitting upon his T square, seemed perfectly contented. I think my first intimate acquaintance with Henry Vaughan began upon that night when I also approached the drawing board without scaring his mouse away. And later, months afterwards, after he had accepted me as a nightly co-worker, when I called to him to come to me, and he found one of his mice eating on my drawing board, the last barrier between us was swept away.

I realize that I learned a large proportion of what little

I know of architecture from Henry Vaughan, and I am grateful to him for that. But I learned from him certain essentials of life, so far removed from American thought and custom as to be difficult of attainment by American youth.

From him, and later when in London I became acquainted with the traditions of the office of Mr. George Bodley, his old master, a new understanding of work and of life came to me. The memory of these men, unobtrusively working in silence for the good, the true, and the beautiful, has been a constant help throughout many difficulties. And the efforts of such can never fail to stretch out over the world for the maintenance of the highest standards of the profession.

GEORGE EDWARD BARTON.

(From the Bulletin of the Boston Society of Architects)

Institute Business

Meeting of the Board of Directors

A meeting of the Board was held at Cleveland on September 6 and 7. There were present President Mauran, First Vice-President La Farge, Second Vice-President Willcox, Secretary Parker, Treasurer Waid, Directors Coolidge, Faville, Fa-ot, Fenner, Jensen, Lubschez, Kimball and Sellers, the Executive Secretary and the Editor of the Journal. The following is a brief digest of the minutes of the meeting:

Disciplinary Procedure in Chapter By-Laws

Formal approval was given to the principle proposed that Chapter executive committees be empowered to dispose of cases not involving expulsion or suspension; when either of these penalties is involved, the Committee must report the case and its investigation thereof to the Chairman of the Institute Committee on Practice. But in all cases, regardless of or in lieu of such action, there may be a final appeal to the Committee on Practice of the Institute as provided in its By-laws. Chapter committees must report the record of all investigations and the decisions made to the Secretary of the Institute for record. The Secretary was instructed to prepare and submit for definite approval a clause covering the above principles.

Contracts and Specifications

The General Conditions of the Contract (Standard Documents) have been revised by the Committee and the revisions have received the approval of the Board and that of the various national associations is now being sought.

The Form of Agreement between Contractor and Owner and the Cover of the Standard Documents have also received minor revisions and will be issued with the General Conditions as the Third Edition, all of which the Board has approved.

The Agreement between Owner and Architect, Fee Plus Cost Basis, with an accompanying circular of explanation, has been approved by the Board and will soon be ready for general use.

The proposed Form of Agreement between Contractor and Owner, Fee Plus Cost Basis, has been circulated as a first draft, and a second draft is now in preparation.

The proposed "Standard Indications of Materials for Architectural Drawings" is now in its third draft form. It appeared in the September Journal, with explanatory text, and a final form will later be submitted to the Board for approval.

The Handbook on Architectural Practice has been distributed, as a first draft, to members of the Board, members of the various Institute Committees, professors in architecture, and the presidents of Institute Chapters.

The Secretary stated that Messrs. Day, Medary, and he, were of the opinion that all of the Standard Documents should be issued under the title of the Third Edition, though no changes have been made in the Sub-contract or Letter of Acceptance, and it was so resolved.

House Committee

There has been no meeting of the Committee this year, but the ordinary upkeep, including minor repairs at the Octagon, have received the attention of the Chairman. Major matters, such as the installation of the sprinkler system and the storage vault, have been handled under the direction of the Treasurer. There have been no new steps in the furnishing of the drawing-room because the Committee has not felt justified in advocating expense in this direction while the building itself is so sorely in need of attention.

Replicas of the McKim Medal have been made at a most reasonable cost, through the interest of Mr. Max Voigt, of Philadelphia. Three sets of casts, at a total cost of $10 are now ready, and it is suggested that one set be placed at the Octagon, one presented to Miss McKim, and another to the New York Chapter.

It is proposed to remove the portraits at the Octagon from the entrance hall and rearrange them, including the one of Mr. Pond which is soon to arrive, either in the drawing-room or on the second floor of the building.

Education

The work of the Committee has consisted chiefly of correspondence bearing upon the schools of architecture and their work, entrance examinations and degrees, and upon the subject of general education in the arts in preparatory schools and colleges. With the advice of President Mauran two additional subcommittees have been arranged to cover the South and Southwest, thus making in all thirteen subcommittees on education. As long as the war continues, educational work will be much hampered by lack of instructors and scholars, and it is doubtful if the Committee can make any definite advance in this work until conditions are more nearly normal.

Competitions

The report commented upon the inquiry from the Boston Society of Architects as to whether the responsibility of applying discipline to Institute members who have taken part in unauthorized competitions rests primarily with the local Chapter or with the Institute, and upon the reply which has been made to the effect that the general custom has been to bring violations of such a nature before the Committee on Practice of the Institute where the offenders were Institute members. Other inquiries of the like nature from other Chapters have been answered in the

same way. Proposed competitions in Buffalo, Kansas City, New York, South Carolina, and Wisconsin were reviewed. The report also referred to the circular proposed by the Minnesota Chapter and intended to apply to work of lesser magnitude. The matter is still pending for final consideration. In conclusion it was stated that the duties of the Committee are largely becoming advisory, which speaks well for the constructive work done by the Committee in the early years of its service. The effort has been made to devise some practical method of carrying out the Convention suggestion that the Committee collect and preserve documents relative to competitions which have been satisfactorily conducted under the Institute's Code—such documents to be used for reference purposes. While the Committee has been successful in filing much correspondence and many programs as finally approved, it has found considerable difficulty in carrying out the plan. As a rule, the subcommittees are faithful in performing their work up to the approval or rejection of a program, but after the award has been made it is sometimes impossible to get a copy of the program. It has been the policy to leave the solution of local problems to the subcommittees wherever possible, although the effort is made in each case to point out special features which require attention.

Publication

The report reviewed the excellent condition of the Journal finances and the constant and steady growth, which has been unaffected by the war. In reply to a question as to the Structural Service Department, Mr. Whitaker explained the keen interest which had been aroused in this work, especially by those at work upon emergency construction for the Government, as evidenced by their coöperation in the columns of the Journal. Foreign architects, societies, and institutions of research have evinced a remarkable interest, and plans are under way for developing a more intimate relationship in the matter of scientific research in building materials. The Committee's report reviewed the publication of "City Planning Progress," and Mr. Whitaker explained at length the plans which the Journal has under way for increasing its usefulness, among which is the departure for England of Mr. Frederick L. Ackerman as the Journal's special correspondent in Europe.

Fire Prevention

The work of the Institute has not been vigorously prosecuted because of the pressure of other work on the Chairman, who is serving as a member of the Committee on Industrial Safety of the Council of National Defence.

The most important thing done by the Committee was attendance in person by Messrs. Plack and Kohn at the annual meeting of the National Fire Protection Association, in Washington, early in May. Mr. Boyd and Mr. Waid were also present and took part in the proceedings, and Mr. Waid was elected First Vice-President of the Association.

Preservation of Historic Monuments

Mr. Horace Wells Sellers, Chairman, reported that there have been no further developments in the proposed Washington Park project. The resolution of the Board at the January meeting, which was presented to the International Forestry Conference, was not given extended consideration on the ground that the project was a local issue.

The Committee has kept in close touch with the Jackson barracks development at New Orleans, and from recent advices it appears that the War Department has called upon the Levee Board to adopt a plan for levee construction that will encroach as little as possible on the barracks property. The Committee is taking steps to obtain full support for the U. S. Engineers' plans, which are opposed by the Levee Board.

The Committee commends the action of the New York State Association of Architects in suggesting prizes from the Institute to those students in architecture who make surveys and drawings of ancient buildings which may be recommended by committees of the various Chapters of the Institute. This is in line with a custom long established by the Philadelphia Chapter.

The Committee is also studying the situation at Niagara Falls, where the demand for increased power threatens a serious decrease in the flow.

Town Planning

The most important accomplishment of the Committee during the year was the preparation of "City Planning Progress, 1917."

The coöperation of the Journal of the Institute in many ways expedited the publication.

The Committee believes that the volume has been a great success and that it has reflected credit on the Institute.

Restoration of the Octagon Stable

The report of the Building Committee dealt with the tentative cost of repairs to the stable. Mr. Fenner, in presenting the report on behalf of the Chairman, then stated that the sum necessary therefor had been contributed by three members of the Institute, and that Mr. Glenn Brown had offered to supervise the work without remuneration. The thanks of the Board were extended to the contributors and to Mr. Brown, and it was ordered that the work be begun without delay.

Mr. Waid raised the question of the deterioration of the sandstone facing on the exterior walls, and it was directed that arrangements be made, if possible, for their repair.

Registration

Mr. Waid, reporting for Mr. Bannister, reviewed the general situation with especial emphasis upon the educational requirements which should ultimately prevail as a basis for admission to practice, and expressed the hope that model standards of educational requirements should be formulated by the Institute, a work which is already under way in coöperation with the Committee on Registration.

State Building Methods

Mr. Favrot reported at length upon the work of this Committee and renewed the necessity of a definite uniform building policy for the country.

[NOTE.—It is expected that a fuller statement on this question will be made by Mr. Favrot in the columns of the Journal.]

Advertising

Mr. Kimball reported for this Committee, reviewing the origin of the Committee's appointment and of the incidents which culminated in the desire of the Board to clearly define the position of the Institute on advertising by its members. The Committee had agreed upon the definition of undesirable advertising as "self-laudatory publicity procured by the person advertised or with his consent."

Mr. Kimball then presented his own report, which recommended that the subject of advertising be dropped

from among the punishable offenses in the Canons of Ethics, and that the Circular of Advice be revised accordingly. The report was the subject of a lengthy discussion, and it was resolved that in order to determine just what is to be done the Board shall call upon the officers of all Chapters to report every case of infringement of the law in order that the Canon may be fully enforced, and that the question should be further considered by the Board and brought to the attention of the next Convention.

[NOTE.—The Board adopted two resolutions on advertising in professional treatises and in architectural catalogues. These were printed in the September Journal.]

Institute War Service

President Mauran reported that committees of the Institute were now at work upon plans for the marine barracks at Philadelphia and on work at the Brooklyn Navy Yard.

President Mauran also reported upon the important work in Camouflage undertaken by Major Evarts Tracy, an account of which appeared in the Journal for August and it was

Resolved, That the Board of Directors of the Institute desires to express to Major Tracy its interest in the splendid work which he is doing, and to say that the coöperation of the Institute may be counted upon at all times, and that it congratulates him upon his appointment and upon the program which he has initiated and wishes him the fullest success.

The register of architects and draughtsmen prepared under the direction of Mr. Tracy's Committee on Preparedness has been kept intact at the Octagon, and its value is being proven more and more.

[NOTE.—The Institute is now issuing a call for a considerable number of architects and draughtsmen for service in France with the Aviation Corps, and it is expected that the services of architects will be in constantly increasing demand both at home and abroad, in view of the vast construction work which is now under way and in process of planning.]

Letters from the R.I.B.A.

The President formally presented the letter from the R.I.B.A. (published in facsimile in the Journal for August), and also a later letter (printed elsewhere in this issue), together with the reply to the former. The letters were deeply appreciated by the members of the Board, and the Secretary was directed to acknowledge the second letter and to express the thanks of the Institute, on behalf of the architects of America, for the cordial and generous sentiments of hospitality contained therein.

Emergency Government Building at Washington

President Mauran reported at length upon the various projects which have matured in Washington in the face of the serious congestion which has prevailed since the outbreak of war. All of these projects were carefully considered, and it was

Resolved, That while the Board of Directors of the American Institute of Architects is deeply appreciative of the serious congestion in the departments in Washington, and recognizes the necessity of giving the quickest possible relief, it cannot but be gravely concerned lest the effort to provide the needed space shall permanently injure the appearance of the Capital and perhaps make impossible the ultimate development of the Washington Plan; and it therefore urges upon Congress that except in cases where emergency leaves no alternative, and then only upon approval of the plans by the Commission of Fine Arts, no permanent building be erected by the Government until the Public Buildings Commission, now engaged in studying the present and future needs in order to report a comprehensive program for erecting public buildings in Washington, shall have laid its report before Congress.

[NOTE.—An account of recent events in this connection appears in our editorial pages.]

The Treasury

The Treasurer reported that the financial condition of the Institute was very satisfactory and that collections had been better than during the same period last year. It was resolved that the dues of those engaged in active service in the Army, Navy, Marine Corps, Aviation Corps, Red Cross and related services be remitted for the year beginning with January, 1918. The Board has no power of remission for a longer period, but it is to be understood that such remissions will be made from year to year so long as the war lasts.

[NOTE.—The Journal has already notified subscribers that it will be sent free to those on service during the war, or retained at the Octagon for transmissal when requested.]

Some slight revisions of the budget were made in view of the emergency expenses of the Preparedness Fund.

Standard Chapter Constitution and By-Laws

The Secretary presented the final draft of this document, which was approved and its issuance to Chapters authorized.

Entertainment by the Cleveland Chapter

On the second evening of the meeting, the Board of Directors, together with architects from the Chapters in Ohio and nearby states, were the guests of the Cleveland Chapter at dinner. After the address by President Mauran and the subsequent exchange of greetings by the guests, the members of the Cleveland Chapter provided a whimsical entertainment, wherein the spirit of Michaelangelo returned to earth, seeking a brother architect upon whom he could lay his long unworn crown of laurel. His search for such a one offered the vehicle for many amusing comments upon the qualifications of those present, and the part was admirably taken by Mr. Richardson, with Mr. Briggs as interlocutor. On the following morning the Chapter acted as host in an excursion throughout the city, ending at the Mayfield Club for luncheon, which concluded a meeting of much pleasure.

At a meeting of the Brooklyn Chapter held September 24, the following resolution was adopted:

"*Resolved*, That every member of the Brooklyn Chapter be notified, that, in the event that he be called into the military service of the Government, the Chapter will provide for the continuance of his business on a basis of cost, without commission for such services."

Structural Service Department

D. Knickerbacker Boyd, *Associate Editor*

HEATING AND VENTILATING AND MECHANICAL EQUIPMENT IN GENERAL

INDEX TO SUBJECTS TREATED IN THIS ISSUE

(For index of materials previously treated see the General Index, page 530)

10A Societies, Associations, and Other Interests.
10B Educational and Research Work.
10C Boilers and Heating in General.
10D Warm-air Heating, Stoves, Ranges, and Dryers.
10E Blowers, Fans, and Ventilation in General.
10F Air Conditioning, Temperature Control.
10G Natural Ventilation.
10H Chimneys, Flues, and Fireplaces.
10J Pipes, Valves, and Fittings.
10K Radiators, Registers, and Grilles.
10L Metal Work, Ducts, Chase Lathing.
10M Air-Leakage, Guarantees, and Formulæ.
10N Heat Transmission, Insulation, Coverings.
10O Mechanical Equipment in General.

10A Societies, Associations, and other Interests

The publications and activities of the following Societies in the development of mechanical equipment will be mentioned wherever possible in connection with the main heading or subdivision under which they would naturally fall.

1. American Society of Mechanical Engineers
   Secretary: Calvin W. Rice, 29 W. 39th Street, New York City.
2. American Society of Heating and Ventilating Engineers
   Secretary: C. W. Obert, 29 W. 39th Street, New York City.
3. American Institute of Consulting Engineers
   Secretary: F. A. Molitor, 35 Nassau Street, New York City.
4. National Association of Master Steam and Hot Water Fitters
   Secretary: Henry B. Gombers, 50 Union Square, New York City.
5. National District Heating Association
   Secretary: D. L. Gaskill, Electric Building, Greenville, Ohio.
6. National Warm Air Heating and Ventilating Association
   Secretary: A. W. Williams, Columbus, Ohio.
7. American Association of Refrigeration
   Secretary: J. F. Nickerson, 431 S. Dearborn Street, Chicago, Ill.
8. American Society of Refrigerating Engineers
   Secretary: W. H. Ross, 154 Nassau Street, New York City.
9. American Uniform Boiler-Law Society
   Chairman Administrative Council: Thomas E. Durban, Erie, Pa.
10. American Boiler Manufacturers' Association
    Secretary: H. N. Covell, 191 Dikeman Street, Brooklyn, N. Y.
11. National Boiler and Radiator Manufacturers' Association
    Secretary: F. W. Herendeen, Geneva, N. Y.
12. Magnesia Association of America
    Secretary: C. J. Stover, Bulletin Building, Philadelphia, Pa.
13. Low Pressure Covering Manufacturers' Association
    Secretary: C. J. Stover, Bulletin Building, Philadelphia, Pa.
    There is also record of the
14. Boiler Tube Manufacturers of America
15. National Tubular Boiler Manufacturers' Association
16. National Association of Valve Manufacturers

10B Educational and Research Work

(See, also, 1B3*g* and 3C2*a*).

1. In the *Heating and Ventilating Magazine*, April, 1917, it is stated that President Lyle, of the A.S. of H. and V. Engineers has appointed a committee to investigate the matter of the establishment of a bureau of research to be conducted under the auspices of the Society. When John Bartlett Pierce, one of the founders of the American Radiator Company, and its Vice-President, died at his home in Lynnfield, Mass., June 23, 1917, his will was found to create a substantial surplus fund to be used for the establishment of the John B. Pierce Foundation for technical research in heating, ventilating, and sanitation "to the end that the general hygiene and comforts of human beings and their habitations may be advanced."

10C Boilers and Heating in General

10C1 *Departments of U. S. Government*

Issue publications concerning heating, ventilation, and mechanical equipment, both as scientific, technical papers on the production, combustion, and utilization of fuel, and popular literature on home conveniences and economies.

(*a*) Fuels. See 2A3, 2A1*c* and *d*.
(*b*) **Bureau of Mines:** Technical Paper 97, "Saving Fuel in Heating a House." 1915. 35 pp., illus.
(*c*) **Bureau of Standards:** "Investigation of Fusible Tin Boiler Plugs," 1915, and other Technologic Papers; also Bulletins and other publications (1A2*b*) for index to which see "Publications of the U. S. Bureau of Standards," May 8, 1917.
(*d*) **Navy Department** issues specifications in large number for many kinds of materials, pipes, tubing, valves, and other apparatus and devices, and for mechanical systems and appurtenances. Read the "Index to Specifications" (3A1*a*1), for titles and Navy Department serial numbers.
(*e*) **War Department.** (See Journal for September, pp. 423–424.)
(*f*) **Treasury Department**, office of Supervising Architect (see 8B, p. 412). Specifications are issued, but not for general distribution, as mentioned under 5D2*b*.
(*g*) **Department of Agriculture:** For one of the many interesting publications, see 10D1.
(*h*) **U. S. Weather Bureau** compiles for the *Heating and Ventilating Magazine* complete records of the weather in five different localities, which are published, with charts and complete data.
(*j*) **Department of Commerce:** "Abstract of the Census of Manufacturers, 1914," but actually taken in 1915. Contains data on hot-air furnaces, radiators, cast-iron boilers, stoves and ranges, steam and fittings. Price 65 cents, from Superintendent of Documents, Government Printing Office, Washington, D. C.

10C2 *Boiler Standards*

(*a*) While the Constitution of the A.S.M.E. states that "the Society shall not approve or adopt any standard or formula," the Report of the Boiler Code Committee, commonly known as the "Boiler Code," was accepted by the Council of the Society on Feb. 13, 1915, and ordered printed. It is now recognized as a Standard and has been printed by some states, either *in toto* or with modifications, as the law of the commonwealth. It has also official recognition by the important insurance companies featuring this class of protection.

The official title is "Report of the Committee to Formulate

Standard Specifications for the Construction of Steam Boilers and other Pressure Vessels and for Their Care in Service, Known as the Boiler Code Committee." These "Rules for the Construction of Stationary Boilers and for Allowable Working Pressures" are divided into Section I, Power Boilers; Section II, Heating Boilers.

The A.S.M.E. Boiler Code was issued over the signature of twenty-four experts, representing every phase of steam-boiler practice, and this body has been continued as a committee to interpret the Code when occasion requires. Thus far 172 rulings and interpretations of importance to engineers have been published. (See Journal of the A.S.M.E. for the monthly reports of "The work of the Boiler Code Committee".) The Boiler Code is now undergoing its first revision.

(*b*) Many of the specifications for materials comprised within the Code are identical with or modifications of separate standards of the A.S.T.M., which see.

(*c*) The A.S.M.E. also issues reports containing specifications for boiler plate, rivet steel, steel castings, and steel forgings.

(See 10O for reference to the A.S.M.E. Power Test Code which includes Boilers.)

(*d*) See **"Standard Specifications for Boiler Steel,"** adopted by the Association of American Steel Manufacturers, revised 1914, known as Manufacturers' Standard Specifications (1F3).

(*e*) **Cast Iron** with respect to its use in boilers, radiators, etc., see publications of the American Foundrymen's Association, Inc. (1F1).

(*f*) The American Uniform Boiler-Law Society exists for the purpose of promulgating the A.S.M.E. Code as the legal boiler construction code for all the states. It has now been made operative in nine states and eight municipalities. There has been published (87 pp.)

"Condensed Report of The American Uniform Boiler Code Congress," held under the auspices of the Industrial Commission of Ohio, December, 1916, and issued by the American Uniform Boiler-Law Society.

(*g*) The National Boiler and Radiator Manufacturers' Association issues Part I, Section II, of the A.S.M.E. Boiler Code, which deals only with boilers for low-pressure steam- and hot-water heating and hot-water supply.

(*h*) "Universal Safety Standards," Workmen's Compensation Bureau of New York, 1914. Contains section on **Boilers, Valves, and Fittings.**

(*j*) **"A Textbook of Engineering Thermodynamics,"** Charles Edward Lucke and John J. Flather. 688 pp., illus. Gives a numerical answer to the everyday problems of design and performance of heating, refrigerating, and power apparatus.

(*k*) **"Steam Boilers,"** E. M. Shealy. 374 pp.

(*l*) For illustrations and description of **Ideal Smokeless Down-Draft Boilers**, see page xv in Industrial Section, by American Radiator Company.

(*m*) For illustration, table of tests, and other information on **Mills Water Tube Boiler**, see page xiii in Industrial Section, by The H. B. Smith Company.

(*n*) **Inspection and Testing of Steam Boilers**, see information on page x of the Industrial Section, by Robert W. Hunt & Company.

10C3 *Rating and Testing of House-Heating Boilers*

[NOTE.—House heating is the term applied to all boilers not used for power and does not apply merely to residences.]

(*a*) In **"History, Aims and Achievements"** issued 1916 by the N.A. of M.S. and H.W.F. (10A4), it is stated: "About the year 1909 this Association first took up with the manufacturers the question of a proper and uniform rating of house-heating boilers. Later on the A.S. of H. & V. E. joined in the negotiations, with the result that today the National Boiler and Radiator Manufacturers' Association has an accepted basis for the rating of house-heating boilers."

The commonly accepted method of rating has been on the basis of the amount of radiation which it is claimed a given size of boiler will serve. Much has been written and said on this subject.

(*b*) See **"The Testing of House-Heating Boilers"** in the *Heating and Ventilating Magazine*, December, 1916, by L. P. Breckenridge and D. B. Prentice, as presented before the A.S.M.E. In this it is stated that "originally the foot of radiation meant a square foot of radiating surface, but improvements in design and arrangement enabled manufacturers to secure this condensation with less surface, and consequently less iron. The result has been a variable and decreasing value in square inches for the 'foot of radiation.' In fact, the unit has become, as it should, dependent entirely on condensation of steam, which means a heat transfer, rather than on any particular area of metal."

The authors propose, therefore, the following definition of a unit for stating the capacity of radiators and heating boilers; *The "foot of radiation" shall be a quarter of a pound of steam condensed from and at 212° F. per hour.*

(*c*) See, also, discussions which followed this paper, printed in March, 1917, issue of this same magazine.

(*d*) In a letter to the Editor from a prominent manufacturer of boilers, connected with an important association, it is stated:

"If the American Institute of Architects could bring about the establishment of a **standard method of rating heating boilers** it would mean a great step forward in boiler manufacturing.

"Practically every boiler manufactured today, no matter what its catalog rating, will actually develop its catalog rating, but the manufacturer does not tell how it has to be handled to develop its rating. Some boilers, to deliver their rating, have to be fired every four hours with a draft so intense that it almost equals a forced draft, so great is the rate of combustion per square foot of grate. Such a condition, of course, is not reasonable for a heating plant, and the only way to eliminate it is to surround the definition of how a boiler should be rated with certain safeguards.

Amount of Heating Surface Required on House-Heating Boilers

"For maximum economy with any kind of fuel, a boiler should be proportioned so that at least one square foot of heating surface should be given for every 3.45 pounds of water to be evaporated from, and at 212° F. per hour.

"For each 100 square feet of standard direct cast-iron radiation in still air, or its equivalent, 7.25 square feet of heating surface should be used, or that each square foot of heating surface in heater take care of 13.8 square feet of standard direct cast-iron radiation or its equivalent, which is 3.45 pounds of water per hour from and at 212° F.

"The above figures are based on the calculation that for each square foot of direct radiation, ¼ pound of water is condensed per hour from and at 212° F. The heating surface is as recommended by the American Society of Mechanical Engineers.

"Due to the wide difference in coal, it is impossible to specify the exact ratio of grate to heating surfaces, but the following will cover the situation.

Grate Area

"That a grate area or its equivalent be furnished so that a firing period of not less than eight hours may be obtained."

(*e*) The A.S. of H. & V. E. has a Committee on "Code for Testing Low-Pressure Heating Boilers" and is working on this subject. (See 10C4.) In its *Journal* and "Transactions" will be found many interesting and valuable contributions, some of these, issued as reprints are:

1. **"Testing and Rating House-Heating Boilers,"** Wm. Kent. 1909. 10 cents.
2. **"Standards and House Heating Boilers,"** Report of Committee. 1910. 10 cents.
3. **"Basis for Rating House-Heating Boiler,"** F. L. Busey. 1911. 10 cents.
4. **"Definition of a Unit of Heat,"** R. P. Bolton. 1912. 10 cents.
5. **"Code for Testing House-Heating Boilers,"** Report of Committee. 1913. 10 cents.

10C4 *Heating in General*

(See 6J for Heating by Electricity and 7J for Heating by Gas.)

(*a*) The following Pocket Books and Handbooks, which cover the whole range of this issue, will not be referred to again under the subjects into which this issue has been subdivided. Other publications or articles devoted principally to those subjects are separately listed.

1. **"Mechanical Engineers' Pocket Book,"** William Kent. 1916.
2. **"Mechanical Engineers' Handbook,"** Lionel S. Marks. 1916.
3. **"Architects' and Builders' Pocket Book,"** Frank E. Kidder. 1916.

(*b*) The following books contain information on many of the subjects treated in this issue:

1. **"Civil Engineers' Pocket Book,"** J. C. Trautwine. 1913.
2. **"Fire Prevention and Fire Protection,"** J. K. Freitag. 1912.
3. **"Crosby-Fiske Handbook of Fire Protection,"** fifth edition.
4. **"I.C.S. Handbooks,"** and books included in Index to International Library of Technology.

(*c*) See **"Review of Current Technical Literature"** and *Journal* of the A.S.M.E. for information on all phases of this subject. Also reports of committees in that Society. See, also, Standards recommended in reports of committees received by the Council of the A.S.M.E. as follows:

On Standard Tests and Methods of Tests, covering, among other things, the subject of testing of steel.

(*d*) See **"Proceedings"** of the A.S.C.E. for lists of "Current Engineering Literature."

(*e*) The A.S. of H. & V.E. is conducting investigations to determine the relative efficiency of a heating plant during the different periods of the heating season, dividing it up into periods of twenty days for each period and considering a heating season as 160 days, more or less, the first ten days and the last ten days being considered as one period and so on; this will determine the efficiency of the plant at slow, medium, and maximum combustion, and thus determine the relative efficiency of each rate of combustion from a number of such tests.

Through committees and in coöperation with other organizations, it is considering problems affecting all phases of heating. The A.S. of H. & V.E. issues these reprints of papers:

1. **"Design of Indirect Heating Systems—Maximum Economy and Operation,"** F. L. Busey, and W. H. Carrier. 1913. 20 cents.
2. **"Heating and Ventilating of Federal Buildings,"** N. S. Thompson. 1910. 10 cents.
3. **"Development in Heating and Ventilating Industrial Buildings,"** E. L. Hogan. 1915. 10 cents.
4. **"Office Practice in Estimating Heating and Ventilation,"** J. D. Small. 1912. 10 cents.
5. **"Heating a Swimming-Pool,"** C. Teran. 1912. 10 cents.
6. **"Report of Committee on Steam Heating Residences."** 1910. 10 cents.
7. **"Hot Water Heating System** of Crane Co., Chicago Works," F. E. McCreary.

(*f*) See the following in the *Heating and Ventilating Magazine.*

1. **"Notes on the Rise of the Smokeless Boiler."** October, 1916.
2. **"Relative Economy of Heating by Steam at Different Pressures,"** A. Bement. February, 1917.
3. "The Care of a **Vacuum Heating System** in the Summer Months." August, 1917.
4. "A Survey of **Operating Costs in Thirteen School Buildings,"** Jamestown, N. Y., J. M. Cushman. November, 1916.
5. **"The Comparative Effects of Wind and Sunshine on Buildings,"** D. B. Prentice. June, 1916.
6. **"Fuel Economies in House Heating."** H. R. Johnson. December, 1916.
7. **"Failure to Heat Premises—Tenant's Remedy."** February, 1916.
8. "An extensive **Open-Tank Gravity Hot Water Heating System,"** George Stumpf, Jr. October, 1914.
9. **"Hot Water Heating** on a Large Scale," New York State School of Agriculture, November, 1915.

(*g*) "Lefax" issues, among others, the following data sheets:

1. **"Heating,"** from "Mechanical Equipment of Federal Buildings," N. S. Thompson, Chief Mechanical and Electrical Engineer, Supervising Architect's Office. (3–52.)
2. **"Design of Steam and Hot Water Heating Systems,"** M. William Ehrlich. (4–96.)

(*h*) See **"Mechanical Equipment of Buildings,"** a reference book for engineers and architects, by Louis A. Harding and Arthur C. Willard.

1. Volume I: **"Heating and Ventilation."** A reference book for architects and engineers. 1916. 619 pp. The authors have found it necessary, in their own experience, to make extensive use of manufacturers' data in designing the various mechanical systems or plants required in modern buildings. They have therefore not hesitated to include such data in the text, in order to illustrate and facilitate the design of similar systems in each subject treated.
2. Volume II: **"Power Plants and Refrigeration."**

(*j*) **"School Architecture,"** W. G. Bruce. Fourth edition. For architects and school authorities. Chapter on Heating and Ventilating treats most of the subjects in this issue.

(*k*) **"Handbook for Heating and Ventilating Engineers,"** James D. Hoffman. With tables and charts, on design and installation, widely used in colleges.

(*l*) **"The Heating and Ventilating of Buildings,"** Rolla C. Carpenter.

(*m*) **"Manual of Heating and Ventilation,"** F. Schumann.

(*n*) **The Mechanical Equipment of Federal Buildings under Control of The Treasury Department,** N. S. Thompson, has chapters on:

I. Heating and Ventilation. II. Commercial Practice in Regard to Heating Factory and other Buildings. III. Commerical Practice in Regard to Heating by forced Circulation of Hot Water from a Central Station.

(See, also description under 6L.)

This book, written by the Chief Mechanical and Electrical Engineer, office of Supervising Architect, is especially interesting as an exemplification of the practice in that office and contains, besides data elsewhere referred to, discussions on general practice, schedules of piping sizes, sample specifications of the office, estimating data for apparatus in new federal buildings, ducts, flues, tables, and other information applicable to all features of heating and ventilating in all kinds of buildings.

(*o*) **"Heating and Ventilating Plants,"** Charles L. Hubbard. Covers heating and ventilation as applied to all classes of buildings, from the small, furnace-heated dwellings to structures of the largest size. 300 pp., illus.

(*p*) **"Heating and Ventilation,"** C. L. Hubbard. A practical manual of hot-air, steam and hot-water heating, and of modern systems of ventilation. 256 pp., illus.

(*q*) See **"Heat Engineering,"** Arthur M. Greene, Jr.

(*r*) "Notes on **Heating and Ventilation,"** Prof. John R. Allen. A résumé of lectures delivered to classes in heating and ventilation at the University of Michigan. 272 pp.

(*s*) **"Mechanical Equipment of School Buildings,"** Harold L. Alt. 112 pp., illus. Contains Chapters as follows (other Chapters referred to elsewhere):

I. Heating and Ventilating. II. Ducts and Flues. III. **Heating and Ventilating Special Rooms.** IV. **Ventilating Toilets and Laboratories.** XIV. **The School Power Plant.** XVIII. **Vacuum Cleaning.**

(*t*) **"The Ventilation, Heating and Management of Churches and Public Buildings,"** J. W. Thomas. 148 pp., illus.

(*u*) **"Modern Theatre Construction,"** Edward Bernard Kinsila. Contains information **on Heating and Ventilation.**

(*v*) **"Heating by Hot Water, Ventilation and Hot-Water Supply,"** Walter Jones. 360 pp., illus.

(*w*) **"Hot-Water Heating and Fitting,"** William J. Baldwin. 306 pp., illus.

(*x*) **"Warming Buildings by Hot Water,"** Frederick Dye. 319 pp., illus.

(*y*) **"Practical Steam and Hot-Water Heating and Ventilation,"** Alfred G. King. Contains rules, tables, and 300 illustrations, showing in detail all the various heating systems, with pipe, radiator, and boiler connections.

(*z*) **"Steam Heating for Buildings,"** Wm. J. Baldwin, M. Am. Soc. C. E. Descriptive of steam heating apparatus for warming and ventilating large buildings and private houses. 404 pp., illus.

(*aa*) **"Heating by Steam and Hot Water,"** Charles B. Thompson. Has short rules for computing radiation, heat-losses, charts, illustrations, and descriptions of how best to heat water for baths, swimming-pools, etc. 265 pp., illus.

(*bb*) The Engineering Experiment Station of the University of Illinois issues:

1. **"The Economical Purchase and Use of Bituminous Coal for Heating Homes."** A new bulletin. 2. A circular on the installation of a house-heating system, showing the most economical methods of firing soft coal and operating a house-heating plant.

(*cc*) See *"Building Code"* recommended by the N.B. of F.U., 1915. Part XXVI, pp. 173–184, entitled **"Chimneys, Flues and Heating Apparatus,"** contains Sections 178–185 on Chimneys, Smoke-Flues, Gas-Flues and Fireplaces; Smoke-Pipes; Heating Furnaces and Appliances; Stoves and Ranges; Hot-Air Pipes and Registers; Steam and Hot-Water Pipes; Vent-Flues and Ducts; and Dry Rooms. Includes diagrams.

(*dd*) See "Field Practice," Inspection Manual of the N.F.P.A., 1914. Contains sections as follows:

1. Sec. II: **"Heating Hazards."** Treats of Radiation and Conduction of Heat; Effect of Continuous Heat upon Heating Devices; Furnaces and Heating Devices of a Fixed or Stationary Type—Grading of Furnaces—Setting and Mounting—Clearance—General Features of Installation; Furnace Stacks, Chimneys and Flues, Breeching-Features of Installation; Hand or Movable Furnaces; Special Treatment of Miscellaneous Heating Devices; Common Miscellaneous Hazards, in connection with Use of Heat (including: Blower Systems for Heating, Ventilating, Stock and Refuse Conveying).
2. Sec. III: **"Power Hazards,** including Refrigeration." Treats of Steam Boilers; Electric Power—Electric Motors; Gas and Gasoline Engines; Fuel-Oil under Boilers and Furnaces, and for Domestic Use; Refrigeration.
3. Sec. VII: **"Chimneys and Flues."** Treats of proper construction of chimneys and flues and gives Instructions for Repairing Old Chimneys.

(*ee*) **"A Handbook for Superintendents of Construction, Architects, Builders, and Building Inspectors,"** H. G. Richey. 357 pp. Superintendent of Construction, U. S. Public Buildings.

(*ff*) **"Building Foreman's Pocket Book and Ready Reference,"** H. G. Richey. 1,118 pp., 656 figures.

(*gg*) See **"The Building Estimator's Reference Book,"** Frank R. Walker. 1917. Contains a Chapter on "Steam and Hot Water Heating," pp. 3,200–3,207, which gives data for Estimating Steam and Hot Water Heating, Sizes and Costs of Boilers, Pipe and Fittings, Radiation and Bronzing.

(*hh*) **Principles of Heating,** Wm. G. Snow. 224 pp., illus.

(*kk*) See also Industrial Section, page xiii, The H. B. Smith Company.

10C5 *Separate Letting of Contracts*

(See 9G*a* for Resolution A.I.A. Convention, 1913.)

10D Warm-Air Heating, Stoves, Ranges, and Dryers

1. The U. S. Department of Agriculture has issued Farmers' Bulletin No. 270, **"Modern Conveniences for the Farm Home."** 1916. 48 pp., illus. (Hydraulic and Sanitary features described under 9G37.) Gives a description of a hot-air furnace installation.
2. See "Saving Fuel in Heating a House," of the Bureau of Mines, listed under 10C1*b*.
3. The Federal Furnace League, which disbanded some five or six years ago, published, previous to that time, **"The Warm Air Furnace,"** a handy reference book containing a compilation of rules and formulæ to aid in estimating and installing warm-air furnaces. It was the official Handbook on warm-air furnace heating adopted by the National Association of Master Sheet Metal Workers. Cloth bound, 96 pp., including diagrammatic illustrations and tables.
4. The latest publication of this kind is: "Formula and Rules for Installation of **Warm Air Heating**" issued by the National Warm Air Heating and Ventilating Association (10A6). 1917. 10 pp. Contains Full Rule for Determining Heat Requirements; Rules for Pipe; Table of Pipe and Register Sizes; Results of Tests on Wall Pipe and Fittings; Directions and Rules for Cold Air Supply; Fresh-Air Room; Chimney Flues; Desirability of Shapes with Table of Sizes and a Short Rule for Determining Heat Requirements with table of Exposures and other tables.
5. The A. S. of H. & V.E. is gathering data from tests to determine the economic value of stoves for heating purposes. Tests will cover different rates of combustion and transmission at different temperatures to determine the actual value of these appliances for utilizing the heat in the fuel used.

   Tests of hot-air furnaces will be conducted under the auspices of the Society to determine the best ratios for these appliances, in every particular, including the ratio of size of grate to flue area, ratio of grate to chimney area and height, the ratio of heating surface to grate surface, and the relative value of cast-iron or wrought-iron surfaces on different operations.

   Read the *Journal* and "Transactions" of the Society for current reports.
6. The following reprints of papers by the A.S. of H. & V.E. are of interest:
   (*a*) **"Engineering Data for Designing Furnace Systems,"** A. C. Willard. 1915. 10 cents.
   (*b*) **"Rational Methods of Warm-Air Heating,"** Roy E. Lynd. 1915. 10 cents.
   (*c*) **"Design of Furnace Heating Systems—10-Room Residence,"** J. D. Hoffman. 1909. 20 cents.
   (*d*) **"Hot-Air Furnace in Cellarless Houses,"** R. S. Thompson. 1908. 10 cents.
   (*e*) **"Report of Committee on Furnace Heating."** 1910. 20 cents.
7. See the *Warm Air Heating and Sheet Metal Journal*, monthly, National Association of Sheet Metal Contractors. (Serial No. 11.) Contains articles of interest on heating in general.
8. **"Furnace Heating,"** William G. Snow. A practical and comprehensive treatise on warming buildings with hot air. 259 pp., completely illus.
9. **Progressive Furnace Heating,** Alfred G. King. A practical manual of designing, estimating, and installing modern systems. Supplemented by a treatise on construction and patterns of furnace fittings by W. Neubecker. 280 pp., illus.
10. The **Furnaceman's Hand Book,** contains 58 pages of Practical, Simplified Rules and Tables for Warm-Air Furnace Heating, by M. H. Smith.
11. **"Drying Machinery and Practice,"** Thomas G. Marlow. A handbook on the theory and practice of drying and desiccating, with classified description of installations, machinery, and apparatus. 388 pp., illus.
12. See "Heating of Water" (9F) for other information of collateral interest, and Industrial Section, p. xvi, Humphrey Co., for heating of water by gas.

10E Blowers, Fans, and Ventilation in General

(See the references under Heating in General (10C4), the majority of which contain sections covering the subjects included in this heading.)

1. The A.S.H. and V.E. is coöperating with biologists, physiologists, sanitarians, and psychologists to determine, if possible, whether the air in buildings is necessarily less healthful than the outer air, and if so, why. This work is covering a wide range of research and a thorough investigation into every phase of the subject.

   It is investigating the question of improvements in washing and conditioning the air to further improve the art of ventilation and is conducting experiments to standardize the various operations necessary to furnish adequate ventilation.

   Its committees are at work formulating requirements for ventilating buildings to guide the various state legislatures in making up codes for the regulation of such requirements in public and semi-public buildings.
2. See "Report of Committee on **Minimum Ventilation Requirements for Public and Semi-Public Buildings** for Legislation Purposes" of the A.S.H. and V.E. Contains General Suggestions on Compulsory Ventilation, applicable to all classes of buildings, and Special Minimum Heating and Ventilating Requirements applying to all Schools, Colleges, Factories, Workrooms, Theatres, and Motion-Picture Houses. 23 pp.
3. Reprints of papers by the A.S.H. and V.E.:
   (*a*) "Report of Committee on **Blower Systems,"** A. M. Feldman. 1914. 10 cents.
   (*b*) "Report of Committee on **Fan Blast Heating** (1)." 1909. 10 cents.
   (*c*) "Report of Committee on **School-room Ventilation."** 1913. 10 cents.
   (*d*) "New York State Commission on **Ventilation**—1915," Geo. T. Palmer. 1916. 20 cents.
   (*e*) "Open Windows with Mechanical **Ventilation,"** R. C. Taggert. 1912. 10 cents.
   (*f*) **"Ventilation of Telephone Booths,"** R. L. Douglass. 1914. 10 cents.
   (*g*) "The **Centrifugal Fan,"** F. L. Busey. 1915. 20 cents.
   (*h*) "Report of Committee on Method of Taking **Anemometer Readings."** 1913. 10 cents.
4. See "Suggested Regulations of the N.B.F.U. for Blower Systems for Heating and Ventilating, Stock and Refuse Conveying as Recommended by the N.F.P.A." (3A3*a*1 and 3A3*h*.) These have also been published in the *Heating and Ventilating Magazine* as Standard Heating and Ventilating Data Sheets, August, 1917.
5. **"Ventilation Laws** in the United States," published by the Heating and Ventilating Magazine Company. Contains Board of Health Requirements and Regulations of N.B.F.U., together with Model Ventilation Requirements as Promulgated by the A.S. of H. & V.E. 178 pp.
6. "Some **Modern Methods of Ventilation,"** R. Grierson. 187 pp. With special reference to public buildings. Contains information for health authorities, architects, heating, sanitary and electrical engineers, sheet-metal workers, and others who may be called upon to install ventilating apparatus.
7. See "The Design of **Blower Heating Systems** for Factory and Shop Buildings," L. A. Harding and J. A. Moyer. Published by the Pennsylvania State College Engineering Experiment Station in Pennsylvania State College Bulletin, June, 1913. 60 pp.
8. **The Ventilation Hand Book,** C. L. Hubbard. 218 pp. and diagrams relating to Ventilation as applied to Furnace Heating; Ducts, Flues, and Dampers for Gravity Heating; Fans and Fan-work.
9. "The **Ventilation of the School-room,"** Wm. J. Baldwin, M.E. 46 pp., illus.
10. "The **Ventilation, Heating and Lighting of Dwellings,"** J. W. Thomas. Illus.
11. **"The Fan,"** Charles H. Innes. 1916. 302 pp., illus. Includes the Theory and Practice of Centrifugal and Axial Fans, revised by W. M. Wallace and F. R. Jolley.
12. See **"Motion-Picture Houses** in New York City Inadequately Ventilated," *The Heating and Ventilating Magazine*, May, 1916.
13. For notes on **"Air Cooling of Houses,"** from an address by Alexander Graham Bell in *National Geographic Magazine*, see The Builders' Guide of Philadelphia, October 10, 1917.

10E 14 *Duct Charts*

(See, also, all references under 10L.)

(*a*) "Tables for **Ventilating Ducts,**" Chouteau E. Pearce, M.E., published on stiff cards by the Heating and Ventilating Magazine Company. These tables are useful in rapidly estimating superficial area and weights of galvanized sheet-iron rectangular ducts, as usually employed in ventilating work. 50 cents.

(*b*) "Chart for Figuring Round and Rectangular **Ventilating Ducts,**" Chas. A. Fuller. *The Heating and Ventilating Magazine*, August, 1916.

(*c*) See **Pipe Fitting Charts** (10J15) for section on Galvanized Iron Work, Weight of Ducts, etc.

(*d*) See Pehl's Everready **Pipe and Elbow Chart.** 54 pp.

10F Air Conditioning, Temperature Control

Publications listed under Heating in General (10c), but especially many of those in the preceding subdivision on Ventilation in General will be found to treat of these subjects.

1. These are also embraced within the activities of the A.S. of H. & V.E. in connection with Ventilation investigations, and in the Report of the Committee on Minimum Ventilation Requirements it is stated:
"Temperature control, preferably of an automatic type, shall be required for all heated and ventilated rooms. The temperature regulator, whether by automatic or hand control, shall be so arranged that its operation will not decrease the required volume of air-supply for ventilation."
2. The A.S. of H. & V.E. is investigating to determine the best method of dust prevention and humidifying the air from furnaces, and to regulate or control the same. Also to test and determine the value of temperature-controlling devices for hot-air apparatus.
3. The following reprints of papers by the A.S. of H. & V.E. are of interest:
   (*a*) "Report of Committee on **Air Washers.**" 1910. 10 cents.
   (*b*) "Preliminary Report of Committee on Standardizing the **Testing of Air Washers,**" A. E. Stacey, Jr. 1914. 10 cents.
   (*c*) **"Humidity in Relation to Heating and Ventilation,"** L. C. Soule. 1912. 10 cents.
   (*d*) **"Improved Air Conditions** in a Boston Residence," F. I. Cooper. 1913. 10 cents.
   (*e*) "Studies in **Air Cleanliness,**" G. C. Whipple and M. C. Whipple. 1915. 10 cents.
   (*f*) "Problem of **City Dust,**" R. P. Bolton. 1915. 10 cents.
   (*g*) **"Temperature Equivalents of Wind Velocities,"** H. W. Whitten. 1912. 10 cents.
4. See *Heating and Ventilating Magazine:*
   (*a*) "New Ideas in **Air Conditioning,**" W. E. Watt. February, 1916.
   (*b*) **"Air Conditioning for Factory Offices."** May, 1917.
   (*c*) **"Tests of Air Conditions** in an Illinois School," E. V. Hill, M.D. May, 1916.
   (*d*) **"Heating and Ventilation of School Buildings."** Washed recirculated air compares favorably with fresh air. September, 1916. (See, also, correspondence, October, 1916.)
   (*e*) "A Simple Method of Figuring the **Economy of Humidity."** May, 1917.
   (*f*) **"Fuel Economy** with Increased Humidity." March, 1917.
   (*g*) **"Humidity and Automatic Control,"** Harold L. Alt. July, 1916.
   (*h*) "Re-establishment of **Temperature Control** on a central Station Hot Water Plant." April, 1917.
5. The literature of manufacturers of these specialities will usually be found to go fully into details.

10G Natural Ventilation

This term is used to differentiate between forced ventilation and that of skylights and continuous sash and of those forms of metal ventilators used to accelerate and accomplish ventilation without other mechanical accessories. These will also be referred to in Serial No. 11 under Metal Products.

1. Attention is directed, however, to the following information in the Industrial Section especially prepared for presentation in connection with this issue as pertaining to Ventilation.
   (*a*) Description, illustrated, of Sawtooth Ventilating as well as lighting by continuous steel sash—with reference made to the booklet, "Air, Light and Efficiency," David Lupton's Sons Company, p. xvii.
   (*b*) Specifications for and illustration of Swartwout Rotary Ball-Bearing Ventilators with reference made to Data Card published by The Ohio Blower Company, p. xiv.
   (*c*) For reference to the "Star" Fire-Retarding Ventilator, see page xxiii, Industrial Section, Merchant & Evans Co.
2. **"Natural Ventilation** in the Federal Hill School," Harold L. Alt, in the *Heating and Ventilating Magazine*, June, 1916.
3. See, also, references under 10L "Metal Work," and many of those under 10E "Ventilation in General."

10H Chimneys, Flues, and Fireplaces

In the design of these, efficient proportions and construction tightness should be the first considerations, as a protection against fire and to afford a proper draft. The successful operation of any installation may be greatly impaired, if not entirely defeated, by inadequate size or lack of tightness in the joints of the flue.

The N.F.P.A., and the N.B.F.U. have issued valuable illustrated literature on the subject. Drawings and descriptions are to be found therein and in many of the handbooks and other publications heretofore listed, as follows:

1. Terra Cotta, Hollow Tile and Brick (3D).
2. Walls, Chimneys and Flues (4C).
3. The Suggested Municipal Ordinance for Regulating Fire Hazards of the N.F.P.A., entitled "Chimneys and Flues, to Provide for the Safe Construction of Chimneys, Flues and Fireplaces" listed under 3A3c1 and the recommendations of the N.B.F.U. for chimneys and flues in;
4. "Dwelling Houses—A Code of Suggestions for Construction and Fire Protection (3A4d3) will also be found printed and illustrated with line constructional drawings in;
5. "Clay Products for Building Construction" issued by The Sewer Pipe Manufacturers' Association (9B7c); also describes and illustrates fire-clay flue-linings and chimney-tops.
   Valuable data for calculating the area, height, design, erection, and successful use of chimneys and flues will be found in many of the publications listed under Heating in General and Hot-Air Heating and in some of the handbooks and literature of manufacturers who are alive to the necessity of providing adequate draft as a precedent to satisfactory operation of any plant.
6. The A.S. of H. & V.E. proposes experiments to determine a standard for the size and height of chimneys and the strength of draft needed for a given operation; the value of round and square chimneys; the relative efficiency of smooth tile-lined flues compared with the ordinary brick flues; the effect on the draft of diving and underground flues, the friction and heat-loss necessary to overcome the extra travel; the explanation in a practical manner of the laws governing drafts in chimneys and for formulating a standard method of building chimneys to prevent defective drafts.
7. Read **"Chimneys:** Their Design and Construction," by Harold L. Alt, in the *Heating and Ventilating Magazine* for March and April, 1917. Mentions common errors in chimney work, describes the use of draft gage and methods to obviate chimney leakage, gives recommendations for construction, making connections and a table for calculating sizes of flues for residences in proportion to cubical contents of building. Contains illustrations and table of commercial sizes and areas of flue tile. Gives designing data for chimneys and power plant stacks, frictionless charts for brick and steel stacks, and a theoretical draft chart for stacks.
8. **"Chimney Design and Theory,"** W. W. Christie. A book for engineers and architects. 200 pp., illus. Contains Formulas; Tables; Wind-Pressure; Flues; Lightning Protection; General Information.
9. **"Chimney Design,"** edited from various sources, by Walter Loring Webb, C. E. "Lefax" Data Sheet No. 4–106.
10. See *Heating and Ventilating Magazine:*
   (*a*) "Things to Remember about **Chimneys,**" E. C. Molby. October, 1916.
11. "The Ideal Fitter" of the American Radiator Company gives, in connection with each boiler described and illustrated, the size and height of chimney flue required. It also contains "Notes on Chimney Flues" with a table of commercial sizes of tile and unlined brick flues.

For information concerning Colonial Head, Throat and Damper for Fireplaces, see page xxiii, Industrial Section, Colonial Fireplace Co.

10J Pipes, Valves and Fittings

1. The A.S.T.M. has adopted "Standard Specifications for **Welded Steel and Wrought Iron Pipe**," Serial Designation A-53-15.
2. See **Navy Department:** Specifications 10C1*d* and Standards of Water Works Associations, The American Gas Institute, and other Standards which have been referred to under different subdivisions in previous issues, including Sprinkler Equipments (4F3*c*).
3. Tests, reports and discussions on the treatment and corrosion of iron and steel in pipes will be taken up in the next Serial Number (11), under Metal Products.
4. A.S.M.E. Standards recommended in reports of committees received by the Council of the Society and separately published on:
   (*a*) Standard pipe, pipe-threads and pipe-unions.
   (*b*) Identification of power-house piping.
   (*c*) Standard threads for hose-couplings.
   (*d*) Standardization of pipe-thread gages.
   (*e*) The American Standard for pipe flanges, fittings, and bolting.
5. The National Association of Master Steam and Hot Water Fitters issues:
   (*a*) The 1915 U. S. Standard Schedule of Flanged Fittings and Flanges, on which is stated: "The dimensions of the 'American Standard' are identical with the above, and this Schedule was adopted March 20, 1914, by a joint committee of this Association, the A.S.M.E., and the Committee of Manufacturers on Standardization of Fittings and Valves." Cardboard. 24 x 35 inches. $1.
   (*b*) The same as a Chart, 9 x 12 inches.
   (*c*) A folder giving separate schedule of the "Standard" flanges and "extra heavy" flanges.
6. The N.F.P.A. prints in "Proceedings:"
   (*a*) Reports of Committee on Standardization of Pipe and Pipe Fittings.
7. The A.S. of H. & V.E. has issued Reports of Committee on Corrosion in pipe, which will be referred to in next issue, and is now collecting data relating to sizes of pipes used in steam- or water-heating plants; will tabulate such data that the sizes needed for any part of a plant will be readily understood, and continue experiments to add what data may be needed to complete the subject.
8. "**Dimensions and Weights of Pipe and Fittings,**" compiled by the Editors of *Power*. Covers all standard pipes and their fittings.
9. See "Lefax" Data Sheets, as follows:
   (*a*) "**Economical Design of Steam Piping,**" A. Langstaff Johnson, Jr.
   (*b*) "**Resistance of Pipes to Internal and External Pressure,**" K. F. Adamson.
10. "The **Friction of Water in Iron Pipes and Elbows,**" paper by F. E. Giesecke, of the University of Texas, read before A.S. of H. & V.E., July, 1917.
11. See *Heating and Ventilating Magazine:*
   (*a*) "**Pipe Symbol Chart,**" T. W. Reynolds. February, 1916.
   (*b*) "A Handy Chart for Determining the **Weight of Pipe,**" W. F. Schaphorst. March, 1917.
   (*c*) "**Pipe Hangers,**" Harold L. Alt. March and April, 1916.
   (*d*) "A British Tribute to the **Superiority of American Pipe.**" October, 1916.
   (*e*) "**Importance of Supervising Piping** in Customers' Buildings," D. E. Karn, of Consumers' Power Company, Grand Rapids, Mich. August, 1917.
12. "A **Handbook on Piping,**" Carl L. Svensen. 350 pp., illus. Has convenient information and data on piping, fittings, pipe joints, valves, piping drawings, pipe lines, and their accessories.
13. "**Pipes and Piping,**" Hubert E. Colling. Included in the contents are: Steam-pipe conduits; pipe fittings; sizes of pipe; how to distinguish steel from iron pipe; a color scheme for pipe lines; effect of superheated steam on cast-iron valves and fittings.
14. "The **Design of Valves** for Use in High Class Buildings," M. W. Link. Paper No. 172 in the *Journal of the Society of Constructors of Federal Buildings*, March, 1915, pp. 133–142.
15. **Pipe Fitting Charts,** Wm. G. Snow. 284 pp., 220 figures of piping and apparatus for hot-water, steam, and other types, including ducts.
16. For data on Inspection and Tests of Pipe, Valves and Fittings, see the information concerning such services printed on page x in the Industrial Section by Robert W. Hunt & Company.
17. For reference by A. M. Byers Company to book on pipe issued by that Company, see Industrial Section, p. xviii.

10K Radiators, Registers and Grilles

For many references to these subjects see other divisions, particularly Heating in General (10C) and Hot Air Heating (10D).

1. The A.S. of H. & V.E. has special committees, to Determine the Most Effective Place for a Radiator in a Room and to Recommend a Standard Method of Testing Radiators. Investigations are being conducted to determine:
   (*a*) The relative value or ratio of one-, two,- three- and four-column radiators; (*b*) the relative value or ratio of different heights of radiators from 18 to 45 inches; (*c*) the effect of painting, bronzing, or enameling radiators; (*d*) the loss in efficiency when the radiator is enclosed in a recess with only the front exposed, with the front covered with a grill, with the radiator all enclosed with only an opening at the bottom for air and a register in the top of the enclosure, to determine the size of openings at the bottom and size of register at top in proportion to the surface in the radiator; (*e*) the ratio of efficiency of a window radiator enclosed under a seat; (*f*) the ratio of fresh-air inlet and warm-air outlet per square foot of indirect surface; (*g*) the ratio of register to indirect surface, to determine the frictional resistance of the ornamental face of a register.
2. The following reprints of papers by the A.S. of H. & V.E. are of interest:
   (*a*) "**Wall Radiators vs. Long Pipe Coils,**" J. A. Donnelly. 1906. 10 cents.
   (*b*) "**Effect of Painting Radiating Surfaces,**" J. R. Allen. 1909. 10 cents.
   (*c*) "**Determining Volume of Air Passing through Register,**" J. H. Kinealy. 1897. 10 cents.
   (*e*) "**Comparison of Pipe Coils and Cast-Iron Sections for Warming Air,**" Prof. J. R. Allen. Contains tests demonstrating that condensation for both types of surface depends upon friction of air through the heater.
3. See *Heating and Ventilating Magazine:*
   (*a*) "**Determination of Radiator Sizes for Hot Water Heating Plants,**" Freywid Wegelius. January and April, 1916.
   (*b*) "**Best Position for a Radiator in a Room,**" September, 1916.
   (*c*) "**Requirements for Radiator Humidifiers,**" E. P. Lyon. August, 1917. Contains description of a new type capable of evaporating 2.9 gallons per sq. ft. of hot water radiator per day.
   (*d*) "**Apparatus for Testing Heat Transmission from Radiators.**" May, 1916.

10L Metal Work, Ducts, Chase Lathing

See especially the references to Warm-Air Heating, Ventilation, Indirect Heating and the Section on Duct Charts (10E14) and the reference to *The Warm-Air Heating and Sheet Metal Journal* (10D7).

1. See *Heating and Ventilating Magazine:*
   (*a*) "**Practical Sheet Metal Duct Construction,**" William Neubecker. July, 1916.
   (*b*) "**Standard Practice for Sheet Metal Work in Ventilating Systems.** "T. W. Reynolds. December, 1916.
   (*c*) "Comparison of various methods of Figuring Duct and Flue Sizes," Harold L. Alt, October, 1916.
2. Of the publications under 10E, see particularly "The Ventilation Handbook" (10E8) as a complete exposition of the metal work features pertaining to all forms of heating and ventilating.
3. See, also, "Sheet Metal," the publishers of which also publish:
   (*a*) "**Practical Sheet Metal Duct Construction,**" W. Neubecker. 194 pp., diagrams.
   (*b*) "**Practical Exhaust and Blow Piping,**" W. H. Hayes. 160 pp., illus.
   (*c*) "**Elbow Patterns for all Forms of Pipe,**" F. S. Kidder. 73 pp., 35 figures.
4. See, also, *The Sheet Metal Worker.*
5. For reference to alloy steel for galvanized sheets and to other products of American Sheet and Tin Plate Company, see Industrial Section, p. xxxix.
6. **Furring and plastering** over heat-pipes and ducts in chases, walls, or partitions: The importance of using metal as a protection against fire is evident. Suggestions and data pertaining to the use of metal lath for this purpose will be found in the Industrial Section on page xi of the Associated Metal Lath Manufacturers.

For information on Target and Arrow Roofing Tin, see Industrial Section, page xxiii, N. & G. Taylor Co.

10M Air-Leakage, Guarantees and Formulas

1. In an address before the N.A.M.S. and H.W.F. in June, 1916, the Editor of the S.S.D. said:

   "Can you not, in coöperation with the A.S. of H. & V.E., work on developing a basic formula, or officially approving one of those in existence, for computing the amount of radiation recommended in proportion to cubical contents, to outside wall area (for different kinds of walls and different exposures), to window and door openings, etc., and make this available to all architects for instant reference?"

   Several formulas have been put forth for calculating the amount of **radiation required to heat given spaces** under varying exposures, but until of late years not much data was obtainable with respect to transmission of heat and other factors affecting the materials of construction.

2. One that has been largely used was promulgated by John H. Mills in his work "Heat" published over twenty years ago. Others in use known as Carpenter's, Thompson's, or Holbrook's formulas will, with others offered by various authorities, be found in the references under Heating in General.

3. C. B. Thompson, in a pamphlet published in 1909, entitled "**Heat Transmission,**" completely discusses the subject and offers his formula, giving a chart for ready use, with an accompanying diagram for making quick calculations.

4. Particular attention is directed to the complete and extensive tables and formulæ, based on Professor Woodbridge's calculations, in "The Mechanical Equipment of Federal Buildings" (10C4*n*), being the **Basis for Calculating Radiating Surface** used in the office of the Supervising Architect, Treasury Department.

5. See next following Section on **Heat Transmission** for activities of the A.S. of H. & V.E., which will have an important bearing on developments of formulas.

6. With respect to performance affecting guarantees, the A.S. of H. & V.E. is conducting investigations to determine what constitutes a standard performance of a steam- or water-heating apparatus and to determine a standard method by which any heating apparatus may be tested in any weather at or below 50° F. that will be equivalent to a performance of 70° inside in zero weather, or below.

7. "**Heat Loss from Buildings and How to Reduce It,**" *Engineering and Contracting*, March 28, 1917. An editorial advocating and describing the double glazing of windows.

8. See "Lefax" Data Sheets, as follows:
   "**Calculating Heat Losses from Buildings,**" Charles L. Hubbard. From *Power* (4–158), May 19, 1914.
   "**Cubical Contents of Rooms**" (5–346). Giving tables for instantly calculating same.

9. Experiments to determine the relative heat lost through single- and double-glazed wood, steel and hollow metal sash have been conducted recently under the direction of A. N. Sheldon. In a paper before the A.S.M.E., printed in January, 1917, "Proceedings," Mr. Sheldon gives the results of his tests.

10. In Bulletin of Building Data League, (2A5*d*) April, 1916, is printed the results of tests, entitled "**The Leakage of Air through Windows,**" initiated and directed by Mr. Stephen F. Voorhees, with apparatus purchased by the New York Telephone Co. The general results are given in relative form only, as further tests are in progress to determine absolute values, if possible. The results show how serious the leakage of air may be.

11. See Reprints of papers by the A.S. of H. & V.E.:
   (*a*) "**Formula for Radiation for Hot Water Heating,**" Jas. A. Donnelly. 1914. 10 cents.
   (*b*) "**Effect of Wind on Heating and Ventilating,**" H. W. Whitten. 1909. 10 cents.
   (*c*) "**Performance of Heating Guarantees,**" Wm. Kent. 1910. 10 cents.
   (*d*) "**Report of Committee on Heating Guarantees.**" 1912. 10 cents.
   (*e*) "**Window Leakage,**" Stephen Voorhees and Henry C. Meyer, Jr. 1916.

12. See *Heating and Ventilating Magazine:*
   (*a*) "Contractor's **Guarantee of Heating Installations.**" January, 1916.
   (*b*) "Contractor's **Guarantee for Heating System.**" August, 1916.

13. See "**The Control of Air Leakage Around Windows,**" H. McGeorge, in Furnace Heating (10D8) pp. 237–246.

14. **Metal Weather Strips.** Building Data League conducted investigations and issued "Preliminary Specifications and Notes," September, 1916, for discussion among members.

15. It is of especial interest to note that in the calculations of the office of the Supervising Architect (10M4) a different formula is used for buildings equipped with **metal weather strip** equal to about a 10 per cent reduction in the amount of radiation.

10N Heat Transmission, Insulation, Coverings

(See, also, 10M and 10O, as well as the Heating and Cooling of Water 9F).

1. The A.S. of H. & V.E. is collecting and tabulating data of all tests relating to heat-losses through building materials. It will collate the results of new tests till the heat-losses of all materials used in a modern building have been ascertained, and then maintain authoritative data for use as a basis in determining the heating surfaces necessary for buildings of various types.

   It will collect data relative to the heat-loss through covering materials and make tests to verify them and determine the value of insulating materials used for insulating buildings, boilers, pipes, cooling pipes, cooling machinery, and other apparatus.

2. In an address before the N.A.M.S. and H.W.F. in June, 1916, the Editor of the S.S.D. then said: "In the matter of sectional covering and banding on lateral runs, plastic covering on flanges, couplings and fittings, and on the heating apparatus itself, surely some standards of practice could be developed which would greatly aid in establishing a uniform basis of estimating."

3. See "Specification for 85 per cent **Magnesia Non-Conducting Coverings** for Power and Heating Systems" (received March 8, 1917, but not dated), described in a letter, from Prof. Thomas Nolan, Chairman Committee on Materials and Methods, A.I.A., quoted under 4K2.

4. The Low Pressure Covering Manufacturers' Association has under consideration the recommendations of its Standard Committee for a specification on **Air Cell and Wool Felt Covering.** It is expected that specifications for the uniform proper application of such coverings will be given consideration later on.

5. See "List of Inspected Mechanical Appliances," published by Underwriters' Laboratories, for **Heat Insulating Coverings** and Pipe Coverings.

6. See "Mineral Resources of the U. S.," issued by U. S. Geological Survey, 1915, Part II, "Nonmetals," for Chapter on "**Asbestos.**"

7. See "Practical Laws and Data on the **Condensation of Steam in Covered and Bare Pipes,**" C. P. Paulding. To this is added a translation of Péclet's "Theory and Experiments on the Transmission of Heat Through Insulating Materials." 107 pp., illus.

8. See "**Transmission of Heat Through Cold-Storage Insulation,**" C. P. Paulding. Formulas, Principles, and data relating to insulation of every kind. 41 pp., illus.

9. See Reprints of Papers by the A.S. of H. & V.E.:
   (*a*) "**Heat Transmission with Pipe Coils and Cast Iron Heaters,**" L. C. Soule. 1913. 10 cents.
   (*b*) "**Heat Losses through Building Materials,**" L. A. Harding. 1913. 10 cents.
   (*c*) "**Heat Losses and Heat Transmission,**" Walter Jones. 1906. 10 cents.
   (*d*) "**Heat Transmission through Building Materials,**" John R. Allen. August, 1916.

10. See *Heating and Ventilating Magazine:*
   (*a*) "Government Experiments on **Heat Transmission through Walls.**" September, 1916.
   (*b*) "**Effect of Velocity and Humidity of Air on Heat Transmission through Building Materials,**" J. A. Moyer. February, 1916.
   (*c*) "The **Heat Insulating Properties of Commercial Steam Pipe Coverings,**" L. B. McMillan. January, 1916.

11. The Bureau of Standards, in addition to several commercial tests, has been making investigations upon about twenty-five different kinds of materials, the samples being purchased in the open market. These include flax, asbestos, and cork products, and a wide variety of special materials. An investigation of the thermal conductivity of wood is in progress, several varieties having been measured. The very great importance of confined air-spaces in the construction of insulating walls led to an extended investigation of the laws governing heat transmission by confined air, which is being continued.

12. For illustrations and specific data with respect to **Insulations and Coverings,** see pages in the Industrial Section, as follows:
   (*a*) H. W. Johns-Manville Co., p. xx.
   (*b*) Magnesia Association of America, p. xix.

10 0 Mechanical Equipment in General—Power Houses and Cold Storage Plants

Concerning the various features of same there is, in addition to the many publications already listed in this issue, such a vast array of literature that no attempt is now made to do more than mention a few of the books generally applicable and list some of the controlling factors.

10 01 *Information Obtainable.*

(*a*) For many features of Mechanical Equipment, see Serial No. 4, Fire Prevention and Protection; No. 6, Electricity; No. 7, Gas; No. 9, Hydraulics and Sanitation.

(*b*) **"Engineering of Power Plants,"** Robert H. Fernald and George A. Orrok. 1916. 596 pp., illus.

(*c*) **"Steam Power Plants,"** Charles L. Hubbard. 299 pp., illus.

(*d*) **"Combined Power and Heating Plants,"** Charles L. Hubbard. 408 pp., illus. Contents include: Power, heating, and ventilating requirements for different types of buildings; hot-blast heating and ventilation; central plants.

(*e*) **"Small Power Plants."** See, "Mechanical Equipment of Federal Buildings," Chapter IX, described under 6L1*j*.

(*f*) **"Steam Power Plants,"** Henry C. Meyer, Jr. 219 pp., illus. Includes new data on chimneys.

(*g*) **"Heat and Thermodynamics,"** F. M. Hartmann. 346 pp., illus. Home study book, based on the course which the author gives at the Cooper Union Schools.

(*h*) **"Heat,"** E. M. Shealy. 265 pp., illus. Treats of the steam engine, gas engine, refrigerating machine, and air compressor. Elementary.

(*j*) **"Heat Engines,"** J. R. Allen and J. A. Bursley. 320 pp., illus. A book of practice (not design).

(*k*) "The Method of the Future **Central Station Heating,"** A. Williams. *Heating and Ventilating Magazine*, August, 1916.

(*l*) **"District Heating,"** S. M. Bushnell and Fred. B. Orr. 1915. A brief exposition of the Development of District Heating and its Position among Public Utilities. 290 pp., illus.

(*m*) "Lefax" issues among others the following data sheets:

1. **"Central Station** Hot Water Heating by Forced Circulation," Leon A. Warren. From "Mechanical Equipment of Federal Buildings" (6–264), N. S. Thompson.
2. **"Vacuum Cleaning** in Large Buildings," Charles L. Hubbard. From *Practical Engineer* (4–111), March 15, 1914.

(*n*) See **"Vacuum Cleaners,"** described under 6K.

(*o*) **"Hydraulic Elevators,"** William Baxter, Jr. 300 pp., illus. Various makes of elevators fully described.

(*p*) See **"Electric Elevators and Dumbwaiters,"** under 6F.

10 01q *Refrigeration and Cold Storage*

See, also, Heat Transmission, Insulation, Coverings (10N), and for information on cooling of water, see 9F.

1. The American Association of Refrigeration issues:
   (*a*) "Proceedings." Reports of committees, papers, and discussions.
   (*b*) "Bulletins." Reports of investigations made by various committees and commissions of the Association.
   (*c*) Translation in three languages of the entire Proceedings of the Third International Congress of Refrigeration is now in preparation.
2. Data pertaining to the publications of The American Society of Refrigerating Engineers not yet received.
3. See, "Mechanical Equipment of Federal Buildings," N. S. Thompson. (10C4*n*.)
4. See "Power Plants and Refrigeration," L. A. Harding and A. C. Willard. (10C4*h*2.)
5. **"Refrigeration,"** Chas. Dickerman and Francis H. Boyer. A guide to the principles, details, and practice of modern systems of artificial cooling, including construction, equipment, and operation. 128 pp., illus.
6. **"Pocket Book of Refrigeration and Ice-Making,"** A. J. Wallis-Tayler. A reference book on refrigeration and cold storage. illus.
7. **"Refrigeration, Cold-Storage and Ice-Making,"** A. J. Wallis-Tayler. 590 pp., diagrams.
8. "A Practical Treatise on the Production of Low Temperatures as Applied to the Manufacture of Ice and to the Design and Operation of **Cold Storage Plants,"** M. W. Arrowood. 1916. 290 pp., illus.
9. "The Elements of **Refrigeration,"** A. M. Greene, Jr. 478 pp., illus. Contains, in logical order, data from which to design, construct and operate refrigeration apparatus.
10. "Elementary Mechanical **Refrigeration,"** F. E. Matthews. 172 pp., illus. A treatise for the person who is not a specialist but needs concise working data.
11. "Principles and Practice of Artificial Ice-making and **Refrigeration,"** L. M. Schmidt. 232 pp., illus. Comprises Insulation of Cold Storage and Ice Houses, Refrigerators, etc.
12. **"Ice-Making Machines,"** M. Ledoux. The theory of the action of the various forms of cold-producing machines. 258 pp.
13. See **"Air-Cooling and Refrigeration,"** being Notes on Air-Cooling Practice in *Heating and Ventilating Magazine*, May, 1917.
14. **The Bureau of Standards** is conducting extensive investigations, with the coöperation of committees of the American Association of Refrigeration and the American Society of Refrigerating Engineers. These investigations relate to ice, ammonia, brines, the thermal conductivities of insulating materials, and will form the subject of papers.

(*r*) See A.S.M.E. Condensed Catalogs of **mechanical equipment** with general classified directory and an engineering data section.

(*s*) See Sweets' Catalogue, **Engineering Edition**, comprising Materials of Construction, Contractors' Plant and Power-Plant Equipment, indexed and cross-referenced, and containing Specification Digest and Checking List.

(*t*) For data on **Capacity and Efficiency Tests** of Power Plants, and on Acceptance Tests of Power Plant Equipment, see the information concerning such services printed on p. x in the Industrial Section by Robert W. Hunt & Company.

10 02 *Practice Recommended and Standards to be Followed*

(*a*) See the various publications of the N.F.P.A., the N.B.F.U. and A.F.M.F.I. Co. concerned with mechanical equipment as listed in the Journal for March, pp. 144–146, which includes:

1. "Cold-Storage Warehouses: Suggestions for Their Improvement as Fire-Risks" (3A3*d*44).
2. See, also, other recommendations of these authorities mentioned under Heating in General (10C).
3. N.F.P.A. "Index" (3A3*h*5) contains references to Refrigeration and other forms of mechanical equipment.

(*b*) See, also, the appliances and devices pertaining to Mechanical Equipment inspected and labeled by the Underwriters' Laboratories embraced within:

1. List of Inspected Mechanical Appliances (3A6*b*).
2. List of Inspected Electrical Appliances (3A6*c*).
3. List of Appliances Inspected for Accident Hazard (3A6*d*).

(*c*) See Bulletins of the American Association of Refrigeration (10O1*q*1*a*).

(*d*) See Navy Department specifications (3A1*a*2) for "Refrigerators for U. S. Navy (except torpedo craft and tugboats)," Serial designation 12R6, March 10, 1913. Others mentioned under 10C1.

(*e*) See "Boiler Standards" 10C2.

(*f*) See "Pipes, Valves and Fittings" (10J) for the standards mentioned thereunder.

(*g*) See Reports of Committees of the A.S.M.E., the A.S.H. and V.E., and others listed under various subdivisions.

10 02h *Power Test Code*

1. The A.S.M.E. Power Test Code, entitled "Rules for Conducting Performance Tests of Power Plant Apparatus" is a new set of testing codes of the Society to replace those in force up to the present time, relating to boilers, pumping engines, locomotives, steam engines in general, and apparatus and fuels therefor, and extended so as to apply to such power-generating apparatus as the present codes do not cover, including water power, bringing them into harmony with each other and with the best practice of the day.

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Lehigh-Portland Cement Co.	XL
Loomis-Manning Filter Distributing Co.	XLIV
Lupton's Sons, David, Co.	XVII
Magnesia Association of America	XIX
Matheson Lead Co.	XXXIV
Merchant & Evans Co.	XXIII
Mississippi Wire Glass Co.	XXXII
Murphy Varnish Co.	XXXI
National Automatic Sprinkler Association	XII
National Metal Molding Co.	XXVI
New York Blue Print Paper Co.	XXXVIII
Northwestern Terra Cotta Co.	XXV
Ohio Blower Co.	XIV
Pfaudler Company	XXXIV
Portland Cement Association	3rd Cover
Presbrey-Coykendall Co.	XXXIX
Quantity Survey Co.	4th Cover
Sedgwick Machine Works	XXIII
See, A. B., Electric Elevator Co.	IV
Semet-Solvay Co.	XXVI
Smith, H. B., Co.	XIII
Sonneborn, L., Sons Co.	XLIII
Standard Documents	XXXVIII
Taylor, N. & G., Co.	XXIII
Toch Brothers	XXXII
Trenton Potteries Co., The	XLII
U. S. Materials Co.	XLV
Webb Pink Granite Co.	XXXVII
White Pine Bureau	XXX

ROBERT W. HUNT JNO. J. CONE JAS. C. HALLSTED D. W. McNAUGHER

ROBERT W. HUNT & COMPANY

Engineers · Inspectors · Chemists · Metallurgists

Chicago New York Pittsburgh St. Louis San Francisco Montreal Toronto Vancouver London

CAPACITY AND EFFICIENCY TESTS OF POWER PLANTS

Our Testing Department is fully equipped with the necessary instruments and trained observers for conducting all tests to determine the capacity and efficiency of Steam, Gas, and Electric Power Plants; and tests to determine the evaporative power of Boilers and the combined efficiency of Boilers and Furnaces in accordance with the rules of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers.

The Power Plant Tests include tests of the efficiency and capacity of the various units, as well as the combined efficiency of the entire plant.

The services of the Engineering Staff are available for the interpretation of specifications and the arbitration of contested questions.

ACCEPTANCE TESTS OF POWER PLANT EQUIPMENT

Our Testing Department is prepared to witness and report upon performance tests of Oil and Gas Engines; Generators, Motors, and other Electrical Apparatus; and Centrifugal or Reciprocating Pumps at the manufacturers' works, thus securing the purchaser against the acceptance of Power Plant Equipment which does not comply with the requirements of the specifications.

INSPECTION AND TESTING OF STEAM BOILERS

The advantage of Boiler Inspection during construction is emphasized by the many failures reported each year due to hidden defects. In the interest of Public Safety, thorough inspection cannot be too strongly insisted upon when ordering new boilers.

The inspection service this Company offers includes the Inspecting and Testing of the Plates and Tubes at the Mills and supervision of the Boiler during construction by competent men experienced in Plate Manufacture and Boiler Construction.

INSPECTION AND TESTS OF PIPE, VALVES, AND FITTINGS

This material is inspected at the manufacturing works while being fabricated for power plant use. All pipe, valves, and fittings are subjected to hydrostatic pressure test and carefully inspected for proper dimensions and quality of workmanship.

TESTS OF FLOORS, WALLS AND COLUMNS

The constantly increasing use of Reinforced Concrete and of Terra Cotta Tile as a protective and structural material necessitates the testing of full-sized floor and wall sections, in order to obtain authentic data for the Designing Engineer and to demonstrate the durability, strength, and reliability of these materials in service.

Load Tests of floors in new buildings are frequently required by Architects and City Building Departments to demonstrate that the deflection under load does not exceed that permitted by specifications or by the rules of the Department.

The Testing Department is prepared to witness and report upon Load Tests of slabs and floors, Compression Tests of walls and columns, and Tests by fire and water on floors and walls.